The Builder.

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Plan, Netley Abbey.—Drawn by Mr. R. W. Paul ..... *Double-Page Photo-Litho.*
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The Proposed New Museum at Cairo.

THE designs sent in competition for the new museum at Cairo were opened to public view on Thursday, March 14. Not less than 73 sets of drawings are well shown in the spacious rooms of a now disused school, but it cannot be said that the display is satisfactory. Far from it. Some schemes are absurdly ridiculous, others are as absurdly extravagant, whilst every style of architectural detail except that of Mediæval Gothic may be seen. The thing conspicuously absent is genuine architecture. The ponderous columns and massy architraves of Karnak, the wide vaults of the thermæ of Rome, and the slim walls and lofty domes of Saracenic buildings, all depend in most of these schemes upon iron ribs, rolled joists, and lattice girders; there is hardly a genuine piece of architectural construction in the exhibition. The competition is international; the names and mottoes of the various competitors have been rendered invisible. At the same time, as the descriptive writing to some is in Italian, to some in English, and to most in French, it is clear that at least these three nations are represented. One or two sets of drawings are evidently "made in Germany," and one, No. 28, must surely have come from Chicago.

Not a little remarkable is the number of projects sent, we must suppose, by amateurs, or pupils in their first year; at any rate, by people as entirely unacquainted with the most elementary systems of construction as they are with the first principles of drawing. It is affirmed that local genius is represented, and if so, some of these very curious productions may be accounted for. Amid the depressing collection of mediocrities it is not difficult quickly to select some few which are as good as the others are indifferent. The set No. 8, charmingly drawn is, we may suppose, the work of a Frenchman. It has the great merit of expressing in its façade the chief characteristics of the plan. The entrance hall consists of three parallel vaulted halls, and these are again continued as exhibition galleries. The ends of these vaulted halls rule the design of the façade, where they appear with the entrance-doors below and the rest of their section filled with a grille of stone-work. The wing walls of the façade are without openings. Suggestions for the introduction of coloured faïence are shown, but with great restraint. It is doubtful whether the plan would make a good museum, but the design has great merits and is charmingly drawn.

The rock on which so many competitors will surely have wrecked themselves has been the unfortunate effort to make use of details in the style of ancient Egypt. Rameses and all his friends and enemies run wild over the façades of these projects, obelisks bristle round about—in fact, were such buildings constructed they would be as much an indifferent collection of sham antiquities outside as they would be a repository for real antiquities within. And yet some few of these inappropriate schemes are admirably drawn, with immense pains and diligence.

Not far from the set of drawings No. 8 is an example of a make-believe Egyptian temple, and in No. 17, in the ancient Egyptian style, the columns are so numerous that there would be but little place left for exposing the antiquities.

In No. 9, which is probably the work of an Italian, we have a vast church plan, not unlike that of San Gallo for St. Peter's at Rome.

Perhaps one of the most curious sets of drawings in the ground-floor rooms is one numbered 5, which altogether departs from any known types, and there is no reason why the architect should not make such a departure; but in the present case it is done with so much eccentricity and so bad a plan that the experiment can hardly be justified. The writing on the drawings is in English, and a touch of Queen Anne leads us to suppose that they come from England. Across the whole width of the site runs a long and somewhat narrow gallery. This is absolutely plain and unadorned outside except for a round-topped door in the middle and towers at either end. Behind this is set a vast rotunda. Alternatives are given for the treatment of this space. In one alternative it is covered by a dome with an elaborate copper lantern on the top. In the other the walls of the rotunda are carried up to a considerable height, and on the exterior are subdivided into many faces by tall pilaster buttresses, on the top of each of which stands a figure painted green, which we must suppose to be intended for bronze. The roof is flat, and the structure looks exactly like a gas-holder. Within, the flat roof is supported by a lofty stone pillar in the middle, after the manner of a Chapter House. It would be difficult to imagine a room more ugly or more ill-suited for the purposes of a museum. There is unquestionable skill in the design, eccentric and unsuitable as it may be.

The design numbered 21 has considerable merits, but the plan suffers in consequence of long narrow corridors of communication—very ill-lit—being used to join the Exhibition galleries. The galleries themselves would surely form the best corridors. The same fault may be found in several of the projects, large wall-surfaces being thereby completely thrown away.

In design No. 27 we are wafted away from ancient Egypt and find ourselves before such an Eastern palace as springs up suddenly in "the Arabian Nights." A vast court-yard is surrounded by the Exhibition galleries. A dome, rising far into the air and surrounded by many pinnacles, surmounts the entrance, to retrieve the dulness of the walls on either side, which are not pierced by windows; some very slim arcades are introduced which lead nowhere in particular.

On the first landing of the staircase hangs the set of drawings already mentioned, No. 28. They are most carefully studied in all details, and set forth with that brilliant facility in which our French neighbours so much excel. The bluest of blue skies hangs over a prodigious pylon, in the gigantic cornice of which the reflected sunlight gleams. On the symbol of the winged disc tall masts with flaunting flags stand before the massive pylon. The cornice and the columns which flank the door are enriched with polychromy, whilst the wall surfaces stand forth in simple majesty unadorned.

The great central composition is flanked by long wings in the style of the centre. Within, a great gallery runs the whole length of the façade, whilst another leads straight away from the door, forming on plan a sort of ⊥ reversed. When we look at the sections the illusion vanishes away. All this

parade of Egyptian massiveness is to be made of some material but little thicker than carton-pierre, and with this a construction o iron or steel lattice is encrusted We have the Chicago Exhibition building over again. The exhibition galleries are shown as roofed entirely with glass. The galleries would in the summer be simply furnaces.

On the upper landing and hanging on the walls of the stairs are some extraordinary productions. In one we have a vast octagon rising in diminishing stories, and suggesting the towers of Babylon; in another we see a palace in the Rococo style of St. Petersburg; and on the front of a third Rameses the Second has his enemies before him upside down as we may see them at the Ramession at Thebes.

In No. 33, although it is in the Egyptian style, there is some excellent work. It seems, however, doubtful policy to occupy so much room with a very grand staircase, more particularly when the stairs lead away from the principal floor, and up to galleries of very secondary dimensions. Under the stairs, and in each corner of the courts, are apartments which would be nearly dark.

In No. 38 we again find ourselves before a set of drawings admirably carried out. The plan is simple and direct. A wide hall with arched roof leads directly away from the entrance, where it is crossed by a gallery of less importance running the whole width of the face. The wide hall is flanked by large exhibition courts, and these are surrounded on the ground and first floor by galleries. The details of construction are better shown than in most of the drawings. The lighting is well arranged, with long lanterns, solid at the top but pierced with windows at the sides, a system which was so eminently successful at the old Boulac Museum. The detail of the interior decoration is a mixture of Egyptian and Roman. The coffered and vaulted roofs remind us of the great halls of the Thermæ, and galleries carried on columns crossing the large arched openings carry further the impression. The capitals of the columns and many other details are, however, inspired by a study of ancient Egyptian buildings. The exterior is also remarkable for the same mixture of detail, or, it would be more true to say, of inspiration, for there is no direct copying. Well carried out, there is no reason why such a work should not be very successful.

No. 41 should only be referred to as a comicality. It shows a pyramid 100 mètres high and some 150 or 180 mètres wide at the base built in large steps. In the risers of these are windows and in the treads skylights! This remarkable structure would be hollow within, the steps of the pyramid being supported by iron legs which get longer and longer the nearer we reach the centre of the floor-space. On the plan we find some passages which cannot be accounted for in the section, but these passages are so very long that the architect spells them "corridor" with three "r's." All the paints in the colour box are exhausted in depicting the beauties of the edifice, but, unfortunately, the drawings are not to the prescribed scale as set forth in the programme, and consequently it is to be feared that the author has placed himself *hors concours*.

In the set of drawings No. 46 we see the hand of an artist of conspicuous ability. Beautifully drawn, the elevations show us a building with a terrace in front whereon are displayed many large specimens of sculpture, which, it is supposed, might be placed in the open air. The façade of the museum is in two stories, the lower consisting of seven arched openings in a massively-rusticated wall, on which stands a colonnade of the Corinthian order, on the blank wall behind which some coloured decorations are shown. The seven arched openings, all exactly alike, are not quite logical, as they are not, in fact, all doorways, whilst the colonnade above is of no use at all, but is set up "for glory and for beauty." Curved roofs of lead or copper rise above the balustrades and crown with square domes two angle loggie which would give fine effects of shadows to the façade. This architect, differing from all the other competitors, makes his first floor more important than the ground floor, and so far justifies himself for the extraordinary amount of space occupied by the stairs. It is not unfair to say that the museum would be a series of rooms attached to a staircase. The architectural treatment of this part of the design is exceedingly clever. Columns, piers, arches, and vaulted halls open on either hand, but the floor areas would be very ill-lit in many places, whilst wall space is everywhere conspicuous by its absence. As a gallery for sculpture the design might be acceptable, but it seems grievously ill-fitted for a museum of Egyptian antiquities.

In the set of drawings No. 48, we again find a design as beautifully drawn as it is carefully studied in its details. Unfortunately the author has not written upon the plans the destinations of various parts of the building, and, so far as can be surmised, sundry departments are either forgotten or ill-provided for. The plan is exceedingly simple and direct. A large hall, 18 mètres wide, runs across the whole width of the building and is closed at either end by a staircase. From the farther side of this hall run seven parallel halls, offering, with the great hall of entrance, a very large amount of wall space and a fine amount of floor area very suited for the classification of the objects exhibited. On the north, west, and south sides of the rectangle which is formed by these halls there is a series of small rooms lit from the side (the rest being all lit from above). These rooms are surmounted by a similar series on the first floor. The amount of wall-spaces thus secured is very large, but it is doubtful whether so great a number of small rooms would be found suitable. The façade is a a fine composition. The colonnades (perfectly useless) which flank the central mass of the entrance are Ionic in type, but a breadth and mass are given to the work which are Egyptian, and a slight batter to some of the walls adds to the effect. The design is the work of an artist of high ability and refined taste.

The drawings No. 49 are deserving of study. A large area of ground is covered. A central hall rising into a square dome, which shows above the adjoining buildings, but which would not, in fact, form the prominent feature it does in the elevations, is closely surrounded by courts and galleries, all well lighted and well arranged for the purposes of the museum. The library stands forward in a wing from the left angle of the building, and, with the *salle de vente* correspondingly placed on the right, is accessible from within or from outside. The offices of the administration are also well placed; in fact, this plan seems to meet the requirements of a museum exceedingly well—better, perhaps, in some respects, than that of No. 48; but in artistic character it is markedly inferior. There is in it nothing of the monumental. The front has a suggestion of the Palais Royal at Paris, whilst the central hall has in it flimsy iron columns and girders only suited to a temporary structure.

The design No. 56 is for an astonishing structure in the Hindoo style; parts of it are not less than three stories in height, and above these rise countless little domes and minarets, which the museum authorities would be at no small charges to maintain.

The author of the design No. 60 has not complied with the requirements of the programme as to accommodation. A long cruciform plan is set diagonally on the site, and not with its façade towards the principal street on the east, as prescribed. The drawings are indifferently executed, and the details of construction seem but imperfectly studied; indeed, it may be doubted whether, as shown, some of the buildings would stand. The detail is more or less Saracenic, and the walls and arches are banded with red and white. An entrance block, surmounted by a small dome, leads by an ignominious way under the stairs to a long nave, very lofty, with galleried aisles on either side. The junction of the nave with its continuation and with the transepts is surmounted by a tall and ill-shaped dome, which seems to have very inadequate support. A row of little windows is pierced through the vertical wall of the dome; the central space could not be otherwise than very imperfectly lighted. Classification in a building thus planned would be difficult. Additions as the collection increased do not seem to be provided for.

In No. 62 there is shown a very simple and direct plan, resembling, in some respects, that of design No. 38, already mentioned. Rooms to be lit with artificial light only are a prominent feature in the plan, and are permitted by the programme. The façades are not without considerable merit. They are free from all useless colonnades and superabundance of architectural detail. Here and there we are reminded of ancient Egypt, but the general effect is of a building in the Italian style, with large wall-surfaces, and surmounted with a good cornice and simple roof.

So far as can be judged by the style of drawing, &c., the best designs seem all to come from France.

When the decision of the jury is arrived at the papers which cover the names or mottoes will be removed.

The above remarks were written before the award had been made and before any names of the competitors had been divulged. Since it was written the Technical Committee have presented their report to the general committee, in which they have recommended that no first premium should be awarded, as no one set of drawings came sufficiently near meeting the necessities of the case, while four were so good as to be worthy of a premium. Accordingly, the following were recommended for a premium of 225*l.* each:—

No. 38, by M. J. Bréason.
" 46, by MM. E. Loviot & Cassian.
" 48, by MM. Guilhem & Gillet.
" 49, by M. Marcel Dourgnion.
All of Paris.

No. 62, by M. Tranchet was recommended for a second premium, and Nos. 8, 28, 33, and 71 were recommended for honourable mention.

English architects seem to be out of it altogether, and we regret to add that so far as the designs were concerned they did not merit otherwise. Many of the best architects in this country were possibly disinclined to enter into a competition for a building which they would probably have had no control over, and which would have been carried out under the immediate supervision of some minor Government official.

NOTES.

WE quite agree with the purport of a letter which Mr. William Morris has addressed to a daily paper in regard to the west front of Peterborough Cathedral, that the main point we should all look to is that the front should be preserved from danger as it now stands, not that it should be pulled down and rebuilt. It was in that sense that we urged last week that its preservation was a matter of more than national interest. Mr. Morris seems to have a dread that its "restoration" will be attempted. Such an idea had not entered into our consideration; but we quite agree with Mr. Morris that, if there is any chance of that, we ought to be told plainly, before we subscribe anything, exactly what is going to be done with the money. The front "restored" would be of no value; we want it preserved.

IN regard to the two papers read at the Architectural Association, and printed on another page, we fear we must confess that we are far more in sympathy with the contractor's than with the architect's paper. The complaints in Mr. Holloway's paper in regard to the light-hearted generalisations often found in architects' specifications (especially, we imagine, in those of young practitioners in the ranks of "art-architects"), by means of which the onus of finding out what is really wanted is thrown upon the contractor, without leaving him a fair chance of estimating its precise cost beforehand, are we fear only too just, and one is disposed to admire the long-suffering of contractors in regard to specifications in which many things are generalised, but everything is to be "best" and "to the satisfaction of the architect." In regard to Mr. Pinks' paper we agree with him (and we observe that the President of the Association also does) that a great deal more might be usefully done in the way of representing and defining materials on the drawings themselves; we have always been in favour of this method as far as it can be carried out without overloading the drawings with notes, as it is a clearer and more immediate manner of indication than a separate written description. But this method cannot possibly be applied to such an extent as to dispense with the necessity for a detailed specification; and, beyond what can be clearly and unmistakably defined on the drawings, the more detailed and precise a specification is the better; for two reasons. In the first place, when buildings are carried out by contract, and competition cuts everything so close, it is unfair to the contractors not to give them the most detailed information of what you mean to require of them, and leads to random estimating and attempts to get things right by clipping and saving under the rose. In the second place, there is nothing better for the architect (especially a young architect) than careful and precise specifying. He then begins to think and realise what he precisely wants and how it is all to be done; he knows his projected building through and through, and sees in his mind's eye how it is going to be put together. Moreover, let us add, an architect who will not undertake what he thinks the drudgery of precise specifying will end by finding himself a tool in the hands of the quantity surveyor.

CONSIDERABLE interest has been taken in recent years in the researches of English seismologists resident in Japan, in regard to methods of constructing buildings and engineering works in earthquake countries. No one has contributed to our knowledge in these matters to a greater extent than has Professor John Milne, F.R.S., of Tokyo. We have on more than one occasion devoted space to the results of his observations, and it is now with profound regret that we note the destruction by fire in Tokyo, on February 17 last, of practically all the original records, extending over twenty-five years, on which his chief conclusions as to foundations and kindred subjects were based. The practical uses to which seismology has been put by him are too well known to architects, and especially to engineers, to need recapitulation at the present moment. The records now destroyed comprise many valuable unpublished notes as to the effects not only of great earthquakes, but of smaller earth tremors which are believed to exert considerable influence, in the aggregate, on the stability of buildings. We know that Prof. Milne has, during the past two years, been actively engaged in working out particulars as to vibrations in buildings, and it is much to be deplored that the innumerable facts as to earthquake movement, from which alone he would have been able to arrrive at precise results, should now be lost for ever. Information as to this disaster has only been received in England during the past few days, but the Geological Society, at the instigation of its President, Dr. Henry Woodward, F.R.S., has lost no time in calling attention to the matter. At a meeting held on Wednesday last the Council passed a resolution of sympathy with the distinguished Professor, and it was observed that seismology in all its bearings had received a serious blow from which it could not recover for many years.

THERE are many people who carefully avoid walking on the lids of the street-boxes of the electric lighting companies. The sensational paragraphs that appear in the evening papers are mainly responsible for this, but an attentive perusal of Major Cardew's report on the Southwark Bridge explosion may increase the number of the careful ones, especially in frosty weather. The Cannon-street accident must be considered as due to a blunder on the part of the City of London Electric Lighting Company, but they have since taken precautions to make a recurrence quite impossible. The risk that one runs in walking over or near a street-box is of being blown up in the air or of being hurt by flying *débris* due to a gas explosion which may be caused by the gas leaking from the gas mains coming in contact with the match of the smoker who drops it down a grating, or possibly even, as Major Cardew suggests, from the spark formed by a horse's hoof striking a flint. The Southwark Bridge explosion, too, proves conclusively that a whole series of explosions can travel along the electric conduits. On that occasion there were five separate explosions, and if it had occurred later on in the day, when the gas had penetrated further along the conduits, there is no saying how many explosions would have occurred. Each individual explosion may not be very serious, but most people would object to being raised suddenly 6 ft. or 7 ft. in the air, as a man on the bridge was, according to the evidence of a policeman. A whole network of mains is laid under the streets of the City, and what occurred on Southwark Bridge might very well happen there, possibly with much more serious results. Hence Major Cardew thinks there is cause for anxiety, and thinks it imperative that the Board of Trade should compel the City of London Electric Lighting Company to take the necessary measures to secure the public safety. We shall probably, therefore, soon see the company filling up their boxes with incombustible material of some kind. In his report Major Cardew has nothing good to say of the gas companies, the primary authors of all the mischief:—

> "It again directs attention to the very serious danger to the public arising from the condition of the gas-pipes in many districts, and the way in which they are laid and supported—a danger which is continually increasing, owing to the spread of the use of wood-paving and other impervious substances, and which is temporarily intensified by every severe frost."

The report, as we have said, may add to the fears of the timorous ones, at least for the present; but it may calm them to know that their enemy is coal-gas, and that there is no fear of a sudden shock electrocuting them on the spot.

FROM the report by Mr. T. W. Thompson to the Local Government Board on the Water Supply of Lympsham (Axbridge Rural District), it appears that this parish is in a very unsatisfactory state as to water supply. The land on which Lympsham is situated is very flat, and intersected by large ditches, which unite at various points to form main dykes, or, as they are locally called, "rhynes." The soil immediately beneath the surface mould consists of clay to a depth of some 10 ft. or 12 ft., below which there is a stratum of peat. The general sanitary arrangements of Lympsham are of a very unsatisfactory character. Slop sewage and the drainage from piggeries is discharged directly into the ditches. For excrement disposal privies are in general use, and in many instances are constructed on the banks of ditches, into which they discharge. When this is not the case, they usually discharge into under-ground pits or cesspools, which are not generally so constructed as to prevent soakage from them into the surrounding soil. Consequently the ditches and rhynes are seriously polluted, nuisances from this cause abounding in the village. This pollution of the ditches and rhynes has an important bearing upon the question of water-supply in the parish. Water-supply, so far as the parish of Lympsham affords it, is obtained either from wells, ponds, or ditches and rhynes. The wells almost entirely consist of "shallow wells" sunk into the clay, which they do not completely perforate—perforation of the clay having apparently been expressly avoided with a view to guarding against the admission of water from the peat formation below it. Internally, the wells are dry-steined with rough stone. Many of them are covered over and provided with pumps, but others, usually provided with movable covers, have no pumps, the water being obtained by dipping with some vessel attached to a stick or chain. These wells afford a highly unsatisfactory source of supply. Not only are they liable to fail in years of low rainfall, in which case the cottagers have recourse to water from the ditches and ponds, but it is clear that they must be in frequent danger of pollution. As a matter of fact, too, some of them are situate but comparatively short distances from drains, privy cesspools, or highly polluted ditches. Mr. Thompson concludes his report by a strongly-expressed opinion that it is the duty of the Axbridge Rural District Council to take immediate steps to provide a proper and wholesome water-supply for Lympsham.

WE lately adverted * to the sale for building purposes of the "Ivy Lodge" estate, in Fulham-road. As will be seen from an advertisement in our columns of last week, another notable old house in that locality is also to be pulled down. It is "Munster," sometimes called "Mustow House," which stands by the main road, opposite the site of Fulham Lodge (home of George Colman the younger and the late Duke of York), eastwards of Ivy Lodge, and nearer Pursei's Cross. There is a tradition that it had been, with an extensive park, a hunting-seat of Charles II. But that story seems to be falsified by the fact, stated upon documentary evidence by Lysons, that during the greater part of the seventeenth century it formed the residence and property of Sir William Powell, Bart., and his predecessor, Sir Edward. The name is supposed to be derived from King George I.'s favourite, the Duchess of Munster. The Powells were here succeeded by Sir John Williams, Bart., who married Mary, sole daughter and heiress of Sir William Powell, of Pengethley. The house next served for a school, and was afterwards occupied, until about 1822, by J. Wilson Croker, M.P., when Secretary of the Admiralty, who somewhat altered the exterior, and added the brick embattlements. For some years past Munster House has been occupied as a private asylum.

THERE has seldom been seen, at private view days at the Society of Fine Arts, an audience so intent on the works exhibited, as on Saturday last, in the room which contained Sir John Tenniel's drawings. The usual social and conversational element at a "private view" seemed almost in abeyance, and every one was diligently looking at the drawings. The majority of these, for the weekly cartoons in *Punch*, are in pencil, and the engravings are not therefore facsimiles of the artist's line. Admirable as they

* See "Note," December 22 last.

appear in *Punch*, a study of the original drawings gives one a much higher idea of Sir John Tenniel's delicacy of style and finish than we ever receive from the cartoons in their published form. On this account alone, it is worth while to study them. The larger drawings in ink, made chiefly as double-page plates for *Punch's Almanack*, were we presume reproduced automatically. The play of humour in some of these, and the varied power of what may be called refined caricature of all kinds of types and characters which they display, are very remarkable; perhaps one of the most delightful of all is "The Vision of Utopia" (55), a thing the study of which ought to have quite a Christianising influence on persons of evil and quarrelsome temperaments. But in the cartoons it is not only the power of drawing that we admire, but the power of tragic and pathetic expression which many of them display; the faculty of concentrating a whole political or national situation in a single emblematic figure. Such are "Germany's Ally" (6), the figure of starvation on the Paris ramparts; "Væ Victis," where the figure of the German Emperor riding into the gate of Paris seems to sum up the whole character of the Teuton conqueror; the impressive figure of Bellona stirring in her sleep, "Unrest" (108). One of the finest of all the serious cartoons, "Dropping the Pilot," is not here, because it was purchased by an English statesman as a present to Prince Bismarck. The humorous cartoons are fully as good in their way, and one is struck by the admirable skill with which the predominant characteristics of eminent public men are seized and pourtrayed; but it is the serious ones that show more especially what a great artist Sir John Tenniel is, not only in power of execution but in intellectual force of conception. What a refreshing contrast do these works present to those of Rowlandson, the last satiric artist illustrated in the same room.

AMONG other picture exhibitions opened this week is a collection of bright and spirited architectural sketches from Tunis, Algeria, Tangiers, &c., by Mr. Ernest George. These are also at the Fine Art Society's Gallery. We suggested when there was an exhibition of Mr. George's sketches of architecture at this Gallery some time since, that the colour and tone seemed to be too much the same in sketches from different parts of the world. In the present collection these Oriental subjects seem to be treated with much more distinctive colour. Among the most effective are "The Old Harbour and Lighthouse, Algiers" (19), the "Old Church, Gibraltar" (33), and "Old Houses by the Harbour, Algiers" (39). Messrs. Arthur Tooth & Sons' Spring Exhibition at their Gallery in the Haymarket contains among other things a beautiful work by M. Dagnan-Bouveret, a half-length figure of a "religieuse," under the title "Vespers" (12); an interesting picture by Bastien-Lepage, "Pauvre Fauvette" (35); a Girl's Head by M. Jacquet, under the title "Mignon" (74), which is a masterly piece of painting; Mr. H. W. B. Davis's exquisite picture "Summer-time" (52), formerly in the Royal Academy; and a good many other works of interest. This exhibition also contains one of the finest pictures of Highland cattle and mist that Mr. Peter Graham has ever produced, and a very interesting little bronze statuette, "Truth," by Mr. J. Mackennal. At Mr. Maclean's exhibition in the Haymarket are to be seen several very interesting works; a splendid view of his favourite "Arundel" by Mr. Wimperis (68); two or three admirable cattle scenes by Mr. Louis B. Hurt, a painter whose name we are not familiar with; some good works by Mauve (apparently early, they are not in the tone of his later and better-known manner); a fine still-life painting by Vollon; "Grace before Meat," by Israels; a very good architectural painting by Mr. Bauernfeind, "Entrance to the Temple at Damascus," in which the decorative bronze doors in the foreground are splendidly executed; and other good works by M. Clays, Mr. Peter Graham, Mr. M'Whirter, Mr. Henry Moore, &c.

THE Bach Festival which has been held on three evenings this week at the Queen's Hall afforded forcible illustration of the mistake of planning an orchestra with no knowledge of or consideration for the requirements of large performances. In an acoustic sense the Queen's Hall has been a great success, but the orchestral provision is utterly wrong; the orchestra is larger than necessary for a band, so that for instrumental concerts space is wasted, and a great deal too small for a band and chorus. The consequence is that no great choral work can be adequately given there, and the Bach Festival was necessarily given with a chorus of most inadequate numbers, though the orchestra was packed as full as it could hold. That is what comes of architects planning music-rooms without knowing anything about the requirements of music. The Queen's Hall is now the accepted favourite hall in London, and in many respects deservedly so; but no great choral compositions can ever be adequately given in it, because there is no space for a sufficient number of performers. It is now too late to amend this; it is not likely that another large concert-hall will be erected in London for some time to come; and for any adequate performance of large choral works we are thrown back on the Albert Hall, which, on the other hand, is much too large for solo singing. There is absolutely no building in London, for choral compositions, to supply the place of Exeter Hall; and there might have been, if those who were concerned in planning the Queen's Hall would have taken more trouble to find out what is really required for large musical performances.

LETTER FROM PARIS.

THE committee of selection at the Old Salon, presided over by M. Paul Laurens, have had about five thousand pictures and pastels before them, from which to select the average number of about eighteen hundred works for which room can be found, in addition to the works which previous "recompenses" have exempted from the discretion of the jury.

At the Salon at the Champs Elysées the committee of selection has been presided over by M. Lhermitte, whose vigorous talent will be represented this year at the Champ de Mars by a masterly work intended for the Hôtel de Ville, and which will take the title of a celebrated novel, "Le Ventre de Paris." The scene is in the Halles Centrales, at the time in the early morning when business is in full swing—peasants arriving from the country, porters carrying heavy loads to and fro, with a background of game, fruit, fish, and other articles exposed for sale at the Halles. It is a powerful work in every way, and will probably attract much attention.

The Champ de Mars Salon has been occupying much public attention lately in regard to the promise of the Society to take part in the approaching art exhibition at Berlin, which has been much discussed—too much, perhaps—in the Parisian press. One set blame the French artists bitterly for what they call unpatriotic action in accepting the German invitation; others maintain that the true patriotism is to show courtesy to a nation with which we are in diplomatic, commercial, and artistic relations; which is certainly the reasonable view. French comedians have recently made a German tour, French musicians have had their works performed in Germany, and French painters have sent their works to Munich without any question being raised: why blame those who send their works to Berlin? The procedure is as foolish as the hissing of Wagner's works, which took place seven or eight years ago in Paris. The very people who make this kind of outcry would be the first to complain if Germany refused to contribute to the 1900 Exhibition at Paris.

The works for this latter will probably be actually taken in hand about September, if there is no delay from Parliamentary procedure. For the convenience of the artistic bodies which exhibit at the Palais de l'Industrie, the Government has decided to defer the demolition of that building till the last possible moment. The "Société des Artistes Français," and the "Musée des Arts Decoratifs," will, therefore, still have at least four years undisturbed. The Champ de Mars Salon, however, seems to have its existence more directly threatened by the demolition of the Palais des Beaux-Arts, and the Société Nationale is endeavouring, in view of this difficulty, to obtain permission for the use of the Orangerie of the Tuileries. This will be, however, a very poor site for their exhibition, after their splendid quarters at the Champ de Mars.

The opening of the new section of the Sceaux railway took place this week. The President was prevented by illness from being present. The Municipal Council of Paris was unrepresented for very different reasons. The opening of the new line would have been a great satisfaction to the neighbourhood, had it not been for the high-handed and illegal procedure of the Orleans Railway Company, which has encroached upon property all along the line, and refused to pay compensation either to private owners or to the City authorities. The latter, unfortunately, are hardly in a position to contend with the great railway companies; and in consequence the Minister of Public Works, as the result of some "interpellations" in the Chamber of Deputies, has on its own authority, suspended the works in progress by the "Ouest" Company, on the Esplanade des Invalides, for the establishment of the future station, where the soil had already been turned up and the fine trees cut down. However, thanks to this Ministerial intervention, the Esplanade will probably be preserved, and the new line be continued in a tunnel as far as the Cluny Museum; this prolongation will be an important contribution towards the much-desired metropolitan railway system.

This is the time when small exhibitions abound. That of the "Rose Croix" has opened its doors amid profound indifference. The crowd of eccentric advertisements initiated some years ago by Peladan no longer has its effect, and the Parisians are tired of the mystic and often ridiculous compositions exhibited by this society. The few artists of real talent whose works used to be found there, such as MM. Maurice, Osbert, and Chabas, have gone to exhibit elsewhere, much to the advantage of their works.

The Société Internationale has opened a new exhibition at the Georges Petit Gallery, at which may be seen two good works by Mr. Whistler, a Parisian landscape by M. Aman-Jean, some pretty portraits by M. Alexander, a good landscape by Mr. Johnston, and other works by MM. Brouillet, Grimelund, Thaulow, Sinibaldi, &c.

There is little to say about the "Bretons de Paris" Exhibition, except for a landscape by M. Ary Renan; still less about that of the "Femmes Peintres et Sculpteurs," which has just closed. But special mention must be made of the exhibition of Oriental painters at the Durand Ruel Gallery, especially in regard to the collected works there of Alfred Dehodencq, a powerful painter who died a few years since, and who painted scenes and figures in Spain and Africa with splendid colour and intensity of effect.

After months of inaction, the committee for the decoration of the Hôtel de Ville has renewed its labours, and its first business has been to pronounce the official reception of the pictures by M. Bonnat and M. Puvis de Chavannes. The committee, which has adopted the principle of making the Hôtel de Ville decorations a representation of all the best contemporary art, has allotted a room to M. Jules Cheret, where he will be free to indulge his light but clever vein of artistic fantasy. In regard to M. Forain, the caricaturist, to whom it was proposed to allot a room in the building, decision has been prudently postponed. The suggestion seemed absurd, since M. Forain, who is an admirable humourist in drawing, is about as little of a decorative artist as possible. M. Willette, another caricaturist, would have been a more reasonable choice, since he has shown that he has the temperament of a painter and a colourist when he chooses to exercise it.

Visitors to Paris have for a long time observed with surprise that the church of St. Eustache, though one never sees anyone working at it, appears to be permanently surrounded by scaffoldings and palisades. The fact is, this church, one of the most interesting in Paris from an artistic point of view, is so dilapidated at certain points as to be dangerous. As the mischief gets worse every year, the Department of Architecture has at last called upon the Municipal Council to remedy it. The question is at present under the consideration of that body,

who it is expected will endeavour to preserve a building, in spite of its being a religious edifice, which is one of the finest architectural monuments of Paris.

As we have already mentioned, the late painter Jean Gigoux has left his fine collection of works of art to Besançon, his native town, with the condition that they are to appoint, as curator of the "Musée Gigoux," his favourite pupil, M. Paul Lapret. If the collection has not been formally accepted by the town within eighteen months after the painter's death, M. Lapret is to offer the collection to the city of Paris for one of its museums. M. Gigoux, it is true, has left two important pictures to the Louvre, a Van Eyck and a Rubens, but it is to be regretted that his remarkable collection should not have gone as a whole into our National Gallery of Art, instead of being hidden away in a provincial museum.

Following the recommendation of the Institut, the Minister of Fine Arts has appointed the Abbé Duchesne as Director of the École Française at Rome, in place of M. Geoffroy, who has resigned. It is an excellent choice, for the Abbé Duchesne is well known in the learned world for his numerous archæological works. He is one of the most learned members of the French clergy, and since 1876 has been Professor of History and Archæology to the "Faculté Catholique" of Paris, and is also an ex-member of the Society of Antiquaries of France.

Several talented artists have died during the month, whose names have been already mentioned in the *Builder*, but who claim a short biographical notice.

M. Charles Delort, who has died at Algiers at the age of fifty-four, was a painter who excelled in anecdotic subjects of the eighteenth century, which were a good deal engraved and became thus popularly known. He was a pupil of Gleyre and Gerôme, and obtained the Cross of the Legion of Honour in 1889.

By the death of Mdme. Berthe Morizot (Berthe Manet was her real name), we have lost an artist of eminently original and personal talent. She had exhibited at the annual Salons since 1864, but her later development was much owing to the influence of Manet, whose brother she had married. She had been successful in turn with portrait, interior scenes, and landscape, treating each class of work with admirable technical ability. At the time of her sudden death she was at the height of her reputation.

M. C. E. Armand-Dumaresq was one of the military painters most in vogue at the close of the Second Empire. He was born in 1826, and studied under Couture. He made his first appearance in 1851, with a picture of "Christ Mort," and exhibited the following year "St. Bernard Prêchant la Croisade." But religious painting soon gave place to military scenes, which became his specialty. Among them may be mentioned "Bataille de la Moskowa," various episodes at Solferino, a "Charge de Cuirassiers at Eylan," "Le Retour de l'Île d'Elbe," &c. In 1859 the Ministry of War commissioned him to produce illustrations of the uniforms of the different corps of the Imperial Guard; and in the Exhibition of 1867 he exhibited an interesting collection of illustrations of the popular costumes of France. Remarkable for his urbane and refined manners, Armand-Dumaresq won the regard of every one, and Napoléon III. had a special esteem for him, a feeling which the artist returned by a fidelity to the Emperor in his hour of misfortune, such as is unfortunately rather rare in these days.

THE ARCHITECTURAL ASSOCIATION:

SPECIFICATIONS FROM TWO POINTS OF VIEW —AN ARCHITECT'S AND A BUILDER'S.

THE ordinary fortnightly meeting of the Architectural Association was held at 9, Conduit-street, Regent-street, on the 29th ult., Mr. E. W. Mountford, the President, in the chair.

The minutes of the previous meeting having been read and confirmed, Mr. Banister F. Fletcher, junior hon. sec., proposed a vote of thanks to Mr. J. M. Brydon for conducting the members of the Association over Chelsea Town Hall, Polytechnic, and Free Library on March 16.

The vote was unanimously accorded.

The President said he regretted to announce that Mr. Pinks, who was to have read a paper on "Specifications from an Architect's Point of View," was unable to be present owing to illness. In that gentleman's absence, Mr. Fletcher had kindly undertaken to read the paper.

Mr. Fletcher then read Mr. Pinks's paper, which was as follows:—

In reading a paper before you with the title of "Specifications from an Architect's Point of View," a word of explanation is necessary perhaps to account for a surveyor undertaking the task. Our interests are identical, and as the surveyor is frequently left to explain the architect's intentions in the specification, there is no reason why he should not be able to look at the matter from the architect's point of view. Of course, you must understand I am speaking my own views only in what I am about to say, and not those of any architect or architects in particular; but I hope the remarks I have to offer will not be considered out of harmony with the title of the paper.

I regret I cannot introduce to your notice anything novel or fresh in the art of writing and arranging the clauses of a specification, neither can I suggest any improved or rapid method of preparing the document. But I propose to examine critically the specification as it is; to pass from that to a consideration of the necessity of specifications as they are at present drawn; and thence to a few suggestions for the abolition of specifications as separate documents in a contract.

Take one of the latest of our specifications; does it not strike you that it is an inordinately lengthy document as compared with those written say twenty years ago, and that a mass of matter is now squeezed into its pages that serves only to perplex the clerk of works and worry the builder? Does there not seem a desire to make a record of length and number of pages? Why, even a moderate-sized house requires at least 100 pages of specification nowadays to adequately describe the best way of building it! Perhaps you may urge that a great deal of this is due to the fact of the surveyor writing the specification, but that is not really so, for if a surveyor had his way he would make the specification simply a reduced copy of his bill of quantities, and a specification frequently exceeds the number of pages of the bill of quantities. I think a great deal of the extra length can be accounted for by the introduction of most of the "conditions of contract." These properly belong to the "contract" as the legal document, and only cumber the pages of what should essentially be the working document. An objection also to the incorporation of legal clauses with those necessary for the builders' guidance, is that a possible slight variation in the language of a legal clause which appears in the specification and contract may lead to litigation to settle the difference. I know of a case in which the specification gave as the time to complete the building eighteen months, and in the contract, by an error, it was stated as eight; but it caused much delay and squabbling before the difficulty was settled.

Another cause of lengthiness is the way in which expanded descriptions of trade manufacture are worked in. I saw a specification the other day in which the architect or his surveyor had devoted some three or four pages to a technical description of how to make terra-cotta. I do not suppose the makers would be influenced in the least by this, certainly not the builder; for each manufacturer would have his own way of doing it, and would not vary the custom of his works to suit a particular specification.

Do the wonderful little essays on how to lay drains, make terra-cotta, mix cast-iron, test steelwork or ironwork, which we find in so many specifications, protect our clients or help forward to any serious extent the good and efficient workmanship and materials we all desire to see?

The system of splitting up a specification, rigidly, into trades has much to answer for in introducing elements of confusion and differences. Each architect has his own view as to where a certain article should go, and if he consistently follows out the trade system what a number of references have to be made before you find out all about a window, for example. On one page the sash and frame; on another probably the fastener and sash-lifts; on another the iron tongue; on another the linings and architrave; elsewhere the glass and so on! There are many of these cases where four or five references might be profitably put together, especially when you remember that the practice of allocating the items under trade headings differs considerably. For instance, tile pavings and wall linings get put into the bricklayer by some, mason by others, and plasterer by others. Then the concrete bed for the tile pavings, and rubbish under, and the cement surface for laying the tiles on get into different sections, and so in a simple tile floor we may have to make four or five references before we get it complete. I need not mention many other instances of the difficulty of breaking up the specification into trades, as they will occur to all; but what I want to emphasize is that a great deal of time might be saved by combining things together a little more than is done, and let the trade distinctions take care of themselves.

The phraseology of the modern specification also leaves much to be desired, especially in the constant use of words defining quality. The words best, very best, proper, perfect, &c., are all relative terms of quality which frequently are quite differently interpreted by the architect and builder, the one using the word in the ordinary sense, and the other in the manufacturers' sense. It is no uncommon thing to find in a trade catalogue the expression "extra super best," as meaning something superior to that described as "best"; and although it seems absurd to encourage such superlatives, if you want the best you have to go beyond the ordinary English meaning of the word, and accept the grandiloquent language of the catalogues. The word "proper" is a frequent stumbling-block, and its use should be discouraged as much as possible, especially in the sense in which we find it, as for instance "fir proper door frames." These relative terms of quality should be quite abolished, and the definite expressions of the manufacturers used instead, as by so doing we shall, as regards materials at all events, have a common basis of agreement with the builder. At present quality is left too much to the imagination, and is only implied when it can and should be stated in exact terms.

A common defect is the frequent disagreement between the specification and the drawings it is supposed to describe. In the great majority of cases this arises from the habit of writing a specification and using an old one as a model, and so we get materials specified which the architect does not intend to use, and when the work is being carried out points of difference arise. If quantities are supplied the surveyor can easily adjust the variations in description, but assuming their absence, each person tendering puts his own construction upon the clause, with the inevitable result that whichever way the architect wants the work done an extra ensues. Of course there are builders *and* builders, and the architect has to be prepared for the worst type in these days of close competition.

I think the subject can be narrowed down by asking yourselves, which do you consider the most important part of the contract, the specification or the drawings? I need not pause for a reply, because, of necessity, the drawings must be the paramount factor with the architect and builder, although the employer often attaches more importance to the specification, probably because he understands and can criticise a written description, whereas, alas! drawings to the average employer are like maps to a South Sea Islander.

Does it not come to this, then, that more work on the general or small scale drawings, and less in the specification, would tend to considerably reduce the friction between architects and their clerks of works and the contractors? Carry this idea to its legitimate conclusion, and half the causes of dispute would disappear.

This brings me to the second division of my paper, viz., a consideration of the necessity of specifications as they are at present drawn.

You will perhaps have gathered from my remarks that I am not in favour of lengthy specifications, and I must confess I think they are drawn out to an unnecessary length, without the least equivalent in the way of further security from bad materials or scamped workmanship. And I now have further to admit my conviction that the specification goes out of its way and out of its true course when it ceases to be anything more than a description of materials. It seems to me that the necessary documents or instruments of a contract should be, first, the plans, elevations, sections, and detail drawings; second, the description of the materials to be used, which of necessity must be a written document, and for convenience is called the specification; third, the conditions of contract, or legal restraints, by which you bind the builder to do the work in accordance with the plans and specification, and also bind the employer to pay for the work done.

To successfully carry out this idea it will follow that the small scale drawings must be prepared with perhaps a little more care and with considerably more detail than they generally are at present. I believe much greater attention is being paid to the small scale drawings than used to be the case, and I know many architects whose drawings are so clear, detailed, and annotated that a specification is almost a superfluity. From this I know it is possible for the thing to be done, and if it were adopted as a system, it would be perfectly easy for the draughtsman to add, either

y writing or graphically, to the general drawings, most of the information which now burdens the specification.

For instance, taking the elevations, why should you not express, once and for all, by printing on the drawings the facings you want, the arches, whether axed or rubbed, the parts of the work in Bath, or Portland, or in both, the parts to be cemented or rough cast, the windows which are to open and which fixed, the glass to be used, and many other things? On the plans, why should you not say what flooring or paving you require, what the hearths are to be, what thresholds, what roof-covering? On the section, the sizes of floor-joists and roof timbers, the descriptions of skirtings? Once on the drawings they are done with, few queries would arise, the surveyor will get through his work quicker, the foreman and clerk of works will not be divided between something on the drawings and a contrary description in the specification.

This all may mean rather more work for the architect at first, but will not the apparent loss of time amply repay him in the end, and certainly save delay on the works? A specification of one hundred pages takes quite a week to write, and even then is by no means a perfect document. Human fallibility enters very much into specification writing, and it is impossible in a written document to notice small errors without a close examination; whereas a drawing can be read, by those who make them, and errors detected literally at a glance. Supposing, instead of devoting a week to writing a specification, you gave that week to finishing up and noting the drawings, what a tremendous difference it would cause. I am sorry to suggest more work to those who, perhaps, are already fairly burdened; but I believe it would be more congenial to the majority to spend the week on the drawings rather than on the dry work of specification writing.

Surveyors do occasionally find a set of drawings with all the sizes of timbers figured on, and what I now plead for is an extension of that principle to almost every detail in the building. To satisfy these conditions a set of drawings would have to include a little more detail work, especially in the sections, and the draughtsman would have to put his section lines where they would show most work, instead of shirking the stairs and the lantern lights, as they often do at present. A plan of the roof timbers would also be desirable, and some of the joinery details should certainly be among the drawings.

Assuming you intended carrying this idea into practice (of putting work on the drawings instead of into the specification), the following, I think, would be the additions:—On the plans: the floors would have the material stated and the thickness; as to how the floors were to be laid and the kind of jointing that would remain in the specification, without a detail showed it. The pavings also would be described, and the hearths, steps, stairs, the direction of the joists and strutting, and the trimmers and trimming joists which might not possibly appear on the sections. On the sections: the skirtings, dado, and picture rails, cornices, architraves, thicknesses of doors—description of plastering, whether cement or lime, also the dadoes and tile-hangings. On the elevations: the facings, arches, mouldings, rough cast, timbering, tile-work, what windows fixed and which to open, the glass, the external doors, the window sills, steps, and stonework generally. The roof plan would show at a glance which slopes were to be covered with inferior and which with better slating, also the lap, and whether boarding and felt; the roof, whether tile or lead, the flashings and lead flats, and every other item which at present it takes a few minutes to find in the specification.

This system would save all the difficulty one experiences in trying to locate the position of a certain thing, say a roof slope; you use up all the points of the compass, and you find one part which will not fit in to a concise description. The surveyor takes the slates say as of the superior kind, the builder perhaps reads it differently and puts the inferior kind. If the drawing showed by a note or distinctive colouring which was meant, all must read it in the same way.

From the drawings we turn to the specification, as I suggest it should be, and we shall find more than 75 per cent. of its bulk is gone. In the preliminary part all the legal clauses, such as protection, damage, insurance, payment, time, sureties, rates of wages, will all be relegated to the contract. In the excavator and bricklayer all the descriptions of materials will remain in, and the way they are to be mixed and used, but all such items as depths of excavations, thicknesses of concrete, beds of brick rubbish, thicknesses of walls, mortar, fireproof floors, drains, facing bricks, parts in cement, finishings of internal walls, arches, moulded and gauged work, air bricks; all these would be cut out—as the drawings would show them.

The mason would describe the materials and setting, all other work would appear on the drawings. The slater also would describe the materials and nails to be used. The carpenter would give the usual descriptions as to materials and a general clause about providing all wood, bricks, fillets, slips, and backings.

The joiner would also give the description of materials and method of laying and jointing the floors. Sizes and number of hinges, and prices of locks and furniture (although this could be quite easily put on the details).

The founder and smith would state descriptions of materials and tests, also any ironwork hidden away. All straps and bolts, railings, girders and joists, rain-pipes, and eaves gutters would appear on the drawings.

The external plumbers' work would all appear on the drawings and only the materials specified.

The internal plumber work is a little more difficult to dispose of and until detail-drawings are given for this work, it would have to remain in the specification certainly as regards small pipes and taps.

The plasterer would only describe the materials and the proportions.

All glass would be indicated on the drawings, and therefore the trade would consist of a line or two.

The painter would remain very much as at present.

I have taken a specification of 120 pages, and by cutting out the items which I consider might be fairly described or shown on the drawings, I find it gets reduced to thirty-two pages, which includes some four or five pages for provisional sums and other items for which drawings would not be given.

The reduced specification, which I suggest would be practically a stock document, requiring little if any alteration, except as regards provisional sums, and any alteration it did require would be so slight that an hour would be sufficient to make the alteration. I think this would be a considerable advantage, and the saving of time would be considerable also.

Given a good workable set of drawings, fully noted, with several sections and elevations, and a concise description or specification of the materials to be used in place of the present lengthy one, and I belive good work and little friction would result.

Engineers, to a very large extent, adopt this system with their work, and I have never heard that it suffers, or that it increases their labour.

The third division of my paper will probably meet with some opposition, for I propose in this to abolish the specification entirely when bills of quantities are supplied, and utilise them in its place.

I say that I expect some opposition to this proposal, because I know that there are some difficulties in the way, not the least being that employers know of the specification, and usually expect to see it, whereas bills of quantities to them are unknown. Then again public bodies, such as the Charity Commissioners, require to have the specification submitted to them with the drawings. But these difficulties could probably be overcome by a modified specification such as I suggested just now.

Some architects also do not avail themselves of quantities in obtaining tenders, and to these of course the suggestion would not appeal—others again do not have quantities but have the work measured up at the end. In either case some form of specification would still be required.

But as regards difficulties in combining the bills of quantities and the specification I may point out that in Scotland the specification, apart from the bills of quantities is almost unknown—and, as far as I know, and my experience on this point is not entirely theoretic, no inconvenience is experienced.

Of course usage is, and always has been, a great bar to improvements or alterations of any kind, and the natural conservatism of human nature is not weaker in professional circles than in others, perhaps stronger!

I can imagine some architects objecting to the change because it would give too great a prominence to the quantities, and that it would necessarily result in the quantities becoming a part of the contract; why they should not be I can never understand; the employer pays for them, and they are generally used for the purpose of settling up accounts. The clerks of works refer to the quantities as much as to the specification, when they are allowed a copy; but, of course, as they are merely statements of fact and not descriptive, they are not so useful for reference as they might be. I know there are many surveyors who would strongly object to the change, as they hold the view that the quantities are only for the purpose of assisting the builder to make his tender; but I combat this theory, for in the bills we have a perfect specification if only descriptions indicating their destination in the work were appended, and if it is possible to use them as a specification, it would tend probably to economy. It is perfectly true also that to one unacquainted with the arrangement of a bill it is a complex medley of figures and descriptions; but this is caused very much by the trade system, as in the specifications being rigidly adhered to, and, I am afraid, by a little perversity on the part of some surveyors to increase rather than reduce the complexity. Well, all this would disappear if the specification and bills of quantities were merged in one; we should then have the quantities as a rigid statement of facts, with the requisite descriptions of the specification. As I said before, the Scotch schedule of quantities is specification and schedule, and where we have in England references by the builder to what the specification says, in Scotland he refers to what the schedule states. What is possible there should be so here.

Surveyors ought not to object to the proposal but ought to welcome it, as their work would be brought into greater prominence and into a wider sphere of usefulness than it is at present. For the architect would have it at hand for constant reference, to settle points in connexion with the details; the clerk of works and foreman would also use it, and many extras which are now incurred in ignorance, through the bills of quantities being sealed to them, would be avoided.

A certain class of surveyors I can understand who would object to the change—viz., those who prepare bills of quantities for ridiculously low commission, and to protect themselves against possible errors "amplify" their quantities. To those who add a few rods of brickwork to cover the lack of proper details, or increase the stonework to cover other things, a combined bill and specification would not be acceptable, for the essence of the document would be in its exactness in all parts. I am sure respectable builders do not care for this haphazard quantity system, although it frequently gives them more of one thing than they are entitled to; what they require is, that a bill of quantities shall be a fair representation of the work in the building.

I am prepared to admit that the bills of quantities might be rather longer—that is to say, they would be as at present, plus the necessary detailed description of positions in the building; but a saving would be effected in the printing or copying of the specifications, and the extra time spent on the bills would be saved in the time usually spent in writing the specification.

I do not wish it to be understood that this method would do away with the necessity for detail descriptions on the drawings, but I do believe it would relieve many architects, who dislike specification writing, from a labour which is irksome to them.

How the bills of quantities can be made to answer both purposes I need hardly suggest to those here who do such work; it is a matter of small technical details, and would simply necessitate a careful arrangement of the items, so that each would state its location in the building. Generally I may say that I should group the items together, so that you could, by the quantity given and the description, see at once where the work was intended to go.

It would be impossible for me to give every detail this evening, but I have, I hope, given you enough to grasp my suggestions. The proposal of adopting a shortened specification is one worth considering, but the latter I consider the most important, and also one which, I believe, will be the system adopted in the future.

Whether I have justified the title of the paper, I leave you to judge; at any rate, I have had the architect's view in mind all through, and although I have advised more work on the drawings, I have by suggestions reduced the specification writing to a very small part of your work, and also have ventured to suggest the total abolition of a document loved by neither architects nor surveyors.

The President then called upon Mr. H. Holloway to read a paper on "Specifications from a Builder's Point of View."

Mr. Holloway prefaced his paper with a few

remarks. He expressed regret at the absence of Mr. Pinks, and especially at the cause of it, but added that he was bound to compliment Mr. Fletcher on the excellent way in which he had read that gentleman's paper. When he (the speaker) wrote his paper he had no idea of the lines that Mr. Pinks was going to take. Had he known Mr. Pinks would be so bold as to take the line he had done, he should have written his own paper on very different lines from those he had followed. He had had a feeling that architects looked on the work of writing specifications as so much drudgery and work to be avoided if possible, but he had never thought for a moment that anyone would be bold enough to advocate the abolition of specifications altogether. Builders, from their own point of view, had a complaint against architects that they did not give sufficient time, thought, and care, to the writing of specifications. Mr. Pinks, instead of supporting that view, went in an entirely opposite direction—namely, in favour of relieving architects altogether from writing specifications. He thought those present would see many objections to carrying out such a course. Mr. Holloway then read the following paper.

The subject of this paper was suggested to me by your Hon. Secretaries, and at their request I have prepared a few remarks on specifications from a builder's point of view, but at the same time I have endeavoured to avoid airing any personal grievances or propounding any special fads and crotchets of my own.

I have great pleasure in being here to-night to discuss such an interesting subject, especially as I have the satisfaction of meeting my friend Mr. Pinks in friendly contention, to discuss the matter from two opposite points of view. If there are any hints I may venture to offer, I trust that they may be taken as offered as such, and not in any way condemning architects' specifications or of taking upon myself the position of instructor or censor to architects in regard to this very important part of their professional work. You will not therefore expect from me a full and comprehensive specification embracing all subjects, nor any proposals for revolutionising its form and purposes, but rather the terms on which the general idea of a specification should be based, with the hope that it may tend to prevent difficulties and misunderstandings between the architect and the builder.

I should like to take the opportunity of bearing my testimony to the manner in which, taken as a whole, the architects discharge their most difficult and onerous task of dealing with fairness and justice to the contractor, while at same time acting with loyalty towards their client. During the many years my firm have been in business, we have experienced but two or three instances where there has been a grievance against the architect, and although we wisely insist upon the Arbitration Clause in the Conditions of Contract, we have never yet availed ourselves of its provisions, neither have we had resource to a court of law, excepting in one instance, and even in that case it was no reflection against the architect, as the point at stake was entirely a question of prices, upon which he had been badly advised by the quantity surveyor.

My first suggestion may appear trivial, but from a builder's point of view it is of some importance, namely:—

The form and arrangement of the specification. It should be in the simplest phraseology, carefully prepared and legibly written, also set out in clauses, and under proper headings, with margin or heading notes, each paragraph being indexed. Remember, it is always essential that the architect's copy should be on the job. The general foreman is not often blessed with a college education. Don't send the specification copied on tissue or letter-pressed copying paper, which is in shreds before it has been on the job a month. In these days of cheap and expeditious printing I venture to urge that printed or lithographed copies be supplied.

The conditions of contract should be attached to and form part of the specification. It is not necessary to discuss the form of these conditions, as I presume all architects will loyally adopt that agreed to between the architects' and builders' institutes.

The quantities should be in conformity with the specification, consequently the draft specification should be in the hands of the quantity surveyor before he proceeds with his work; but a little latitude might with advantage be given to the surveyor to vary, or add to, in minor points, in order to bring the drawings, specification, and the quantities in perfect line with each other.

The practice of specifying sub-contractors and specialists is increasingly resorted to, in some cases almost to the extent of having separate firms for the principal trades. Architects who have had works in the North of England, and adopted the system of employing a separate firm for each trade, know something of the inconveniences of this course of procedure. The practice, generally speaking, increases the cost, causes delay in execution, and creates a considerable amount of friction between all concerned. In cases of special works for which special men are required, such as are not usually engaged by the builder, or in the fixing and arrangement of patented goods which the patentees have to guarantee the efficient working and durability of, it may be desirable to provide for the sub-contractor to completely finish his work. But this custom should be minimised as much as possible, so as to give the builder entire and complete control over the whole of the building in course of erection, as he has to be responsible for everything. In all cases where sub-contractors are engaged by architects there should be an undertaking from the sub-contractor to comply with the conditions of the builder's contract as far as the same are applicable to his work. Unpleasantnesses frequently occur between the builder and sub-contractors through the omission of the architect in insisting upon this point. It is urged by architects that this is a matter between the builder and the sub-contractor, but it is obviously more desirable, and only just to the sub-contractor, that this condition should be agreed upon when the latter prepares his estimate.

Probably the bulk of the builders' difficulties arise from a want of definiteness in the description of the architect's requirements. General "covering" clauses in specifications are much too frequent. If the architect has a difficulty in regard to his working drawings, or in connexion with the site of the proposed building, and is unable to specify precisely what has to be done, he has resource to his familiar "friend" (the covering clause), and throws all responsibility upon the unfortunate builder. Here is an extract from a specification as a sample of what I mean.

"Do all necessary cutting and making good. Supply all materials and workmanship necessary, although not herein specified, to render the whole of this branch of the trade perfect and complete to the entire satisfaction of the architect."

The same clause, with a little variation, appears after each trade.

Such conditions as these have only to be exposed to be condemned by reasonable men, but unfortunately they appear too frequently in specifications. In cases where it is impossible for the architect to specify clearly and in detail, and for the quantity surveyor to measure, the work to be executed, the proper and just course to adopt, both to the client and the builder, is to provide an amount to be used under the architect's directions and the work paid for either by valuation after completion, or charged for as day work. There is frequently much indefiniteness in the specification with regard to foundations. The builder has to take many risks for which he has very little opportunity of forming any idea as to whether it will involve an expenditure of 5*l.* or 500*l.* My firm recently tendered for a building where the character of the sub-soil had not been ascertained, to settle the depths of the foundation, consequently a schedule of prices for extra depth of digging and concrete had to accompany the tenders. The prices for the extra digging varied from 18s. to 6s. per yard cubical. The firms tendering were a selected list, and all well-known responsible people. This difficult and unfair position can be easily removed by the architect obtaining the particulars of the soil by means of trial borings, which can be done at a trifling cost.

There should be always a practical reason for what is specified, and nothing should be specified unless the architect thinks it absolutely necessary to carry into actual execution. Also care should be taken not to specify what is a practical impossibility.

The following are a few specimens taken from specifications to illustrate my point, viz.:—"*The excavation to the trenches is to be taken down to a perfectly solid bottom, and the bottom well rammed!*" One naturally asks, why ram when you have a natural solid bottom? Is it not possible that if ramming is enforced you will not have a good solid bottom? Supposing the foreman carries out the specification, digs the trench to the depth shown in drawings, and has the bottom well rammed for the architect's inspection, it is possible the architect may be deceived by the sound appearance of the bottom and have the concrete put in upon what is anything but a natural sound foundation.

"*The concrete in trenches to be well rammed.*" The absurdity of this description is obvious. To ram concrete immediately it is thrown into the trench in a soft condition is quite useless and a waste of labour, and if rammed after it has commenced to set, it would only tend to prevent its adhesion.

"The *stock* bricks are to be hard, well burnt, perfectly *square*, and of *uniform* colour." It is only necessary to visit a brickfield, and see the making of stock bricks to know the impractibility of this description. The description is quite contradictory to the nature of stock bricks, which are burnt in large stacks, or clamps of about half a million each, with fuel sprinkled between to help the firing. The bricks the get the strongest heat will be the hardest, and as a matter, of course, to an extent flared and varied in colour. The weight of such a large quantity stacked together before being burnt must of necessity press the bricks somewhat out of square. The beauty of stock-brick facing to my mind is the slight variation of colour.

"*The mortar to be composed of one portion grey stone lime to two portions of clean sharp sand.*" Either the proportion specified is not expected by the architect, or he must be ignorant of the proper proportions of lime and sand for good mortar. There is no strength in the lime of itself. The proportion of *one* of lime to four of good clean sand makes the best mortar.

Particular quarries for stone are frequently specified (especially Yorkshire stone), which have been worked out for several years. It is desirable, as far as possible, to avoid the mention of particular quarries, unless the clause is modified by the addition of the following:—

"Or stone from some other quarry equal in quality to that specified."

Perhaps the most difficult part of an architect's specification is that in reference to timber, and the builder finds it more trouble than all the other kinds of material combined. The architect generally makes certain ground for himself by specifying that it is to be "perfectly free from sap, large knots, shakes, and all other defects." Such a description is very admirable if the material can be so supplied, but it is perfectly well-known that this degree of excellency cannot be maintained, hence the difficulty of interpreting to what extent sap, knots, and shakes will be tolerated. Unfortunately the opinion of clerks of works (to whom this is usually referred) varies very considerably according to their knowledge, or other contingent circumstances. It is a mistake to suppose that because there is a slight discolouration on the edge of the timber it is unfit for use. Care should be taken to see that no sappy wood is built into a wall, or fixed in a confined position where there is no air space; but for open roofs, floor-joists, and such like, the timber will not rot or become weakened because of a little *blue sap*, which is frequently only surface deep. I have been asked by architects to suggest a suitable and reasonable description for timber and joiners' deals, but have always found it a difficult task to do so. Specifying by means of names of ports and brands is unreliable, as the goods scarcely ever maintain the same quality for two or three seasons together. For a few years a splendid quality of joiners' deals had been imported from the Archangel Port, but last year it was much below the average, and a large proportion of it quite unfit for good-class joiners' work. With considerable diffidence I venture therefore to suggest the following as a reasonable description for timber and joinery deals, viz.:—

For the Best Class of Work.—"The Memel or Dantzic timber of the best selected middling quality."

For Ordinary Class of Work.—"The Memel or Dantzic timber of the good middling quality; or (where scantlings under eleven inch wide, and four inch thick), from sawn scantlings of an approved Swedish or Russian port, not inferior to a recognised good fourth quality Swedish brand, or third quality Russian hammer brand."

"All timber to be free from large and loose knots and shakes, also practically free from sap to the architect's approval."

For Joiners' Deals.—"Good quality, from approved Swedish or Russian ports, free from large and dead knots, shakes, and sap. Not inferior to a recognised first and second quality Swedish brand, or second quality Russian hammer brand."

Pitch pine, and Oregon pine is much used for timber work, also yellow pine for cabinet work, but neither of these American woods is suitable for positions exposed to weather and damp. But

for interior work it is much cleaner in appearance than the Swedish and Russian goods.

A point requiring the special consideration of an architect in prepairing his specification is that of fixing the time to be allowed for the execution of the work, particular regard being given to the period of the year at which the building is to be completed. It frequently happens that a job, say of a new house, or an addition to a house, to the value of 2,000*l.* to 3,000*l.* containing a quantity of good joiners' work is commenced in July or August, and has to be completed by the Christmas following. The specification insists that the joinery work must be of thoroughly seasoned wood, roughly framed together, and put into drying room within a month after signing the contract. (By-the-by, notwithstanding the stipulations, it too frequently happens, that the details are not supplied until after the roof is on.) A moment's thought must satisfy anyone with practical knowledge that to put good seasoned joinery into a building erected under such conditions, simply means ruination to the work, and ultimately serious trouble and expense in easing doors and windows, stopping open joints, touching up shrinkages, &c. Moreover, the builder is condemned for supplying inferior material. In all cases where good plastering and joinery is required, architects should make arrangements to avoid either of the same being proceeded with to any great extent on the building during the winter months.

In conclusion, I would urge that in order to avoid friction, disputes, and to secure good work, there must be mutual confidence between the architect and builder. To secure this the architect should only invite to tender (where competition is required) those with whom he can take counsel and place confidence. There is far too much suspicion, especially on the part of the younger members of the profession. I do not deny there may have been reasons for it, but, speaking generally, builders have a regard for their reputation. They know that one act of rascality exposed means ultimate ostracism. On the other hand, a good sound building is a standing advertisement. Many little misunderstandings and difficulties would be obviated if there was more personal intercourse between architect and builder, especially upon the building. This course has been adopted with most of the architects with whom my firm have done business for any length of time. With these gentlemen we have never experienced the slightest trouble, in complying with their requirements and giving every satisfaction.

The lot of a builder in these times of keen competition, unreasonable demands on the part of workmen, fluctuations of trade, losses by stress of weather, and the exceptional worry arising from what is probably the most uncertain and risky commercial undertaking in the country, is by no means an enviable one. I therefore appeal to you to have some regard to the peculiar difficulties with which the builders have to contend, and urge you to do your part in promoting a good understanding and mutual confidence between the profession and the trade. I can assure you, on behalf of those whom I have the honour to represent, that such good feeling and confidence will be heartily appreciated and reciprocated.

The President having invited discussion:—

Mr. Fleetwood said that the two interesting papers that had peen read contained many valuable suggestions. He fully agreed with all that Mr. Holloway had said. With regard to Mr. Pinks's paper he regretted that it was not accompanied by his ideal specification and drawings. The drawings would certainly have needed the aid of a magnifying glass, and it would have been interesting to see one that had been on a building for six months, after they had been constantly handled by the clerk of the works and the foremen of the various trades, and had been to the top of the roof in a shower of rain, &c. He was afraid that all the information on an eighth-scale drawing would have been obliterated long before the roof was on. He did not think the suggestion was quite practicable. Some architects made drawings for all parts of the building, on an inch or a half-inch scale, and it was quite possible that a lot of information could be put on those, but their number might run into hundreds, and it would be far more difficult to obtain the required information from them than by looking at the specification. A specification should have a very full and ample index, and when it had that, there should be little difficulty in finding what was wanted. As regarded the order in which specifications should be written, there were advantages in departing from the trades. In the case of alterations, undoubtedly the specification should be written in the order in which the work was done. The order of the trades might be modified to a certain extent, and many things might be grouped. For pavings, for instance, all the concrete, cement, tiles, &c., might be put together instead of being scattered through the several trades. At the same time, he thought it would be difficult to depart from the general order of trades. There were certain stock clauses which had appeared in specifications for generations the meaning of which was doubtful. It would, in his opinion, be well if they could be done away with to a large extent. On the other hand, it was almost better to put in a stock clause than a description of something which could not be done, and which was altogether impracticable.

Mr. Woodthorpe agreed with a good deal that Mr. Pinks had written—certainly as to putting as much as possible on the drawing, although often there might be as many as 100 or 200, as Mr. Fleetwood had said. In the country a builder depended a great deal more on the drawings than on the specifications, and he personally found it much easier to see that work was carried out in a proper way, if the item appeared on the drawings, than if he had to wade through a specification of, say, 130 pages in length. Even if a lengthy specification were well indexed by one man, another man experienced much difficulty in finding, on the spur of the moment, a good many items to which he wanted to turn. The more drawings they had, and particularly the more sections, the easier it was to get the sections right. In cases where they had small builders to deal with in the country, it was of the greatest assistance to them to give them as many large detailed drawings as possible. A great many men used eighth-scale drawings, upon which it was easy to get a considerable amount of detail; but, of course, on quarter-scale drawings they could get a much greater amount. In the case of alterations, this course saved a very great deal of trouble. Of course, they would be saved much trouble if they could do without a specification, but he did not think they could possibly do that, unless they delegated a great part of their work to the quantity surveyor, in which case he felt certain they would never get what they wanted. Mr. Holloway had said that architects and builders should loyally agree to carry out the conditions of contract, but he (the speaker) was sorry to say they had never been able to get the conditions of contract. He had been on the Standing Committee of the Institute for some years, and they had never been able to get conditions settled with the builders which would be of any use at all. He hoped the Institute would soon adopt conditions of their own, and get them printed, so that the matter might be settled. In specifications the general covering clauses should be done away with as far as possible. It was much better, even in a specification of alterations, to describe exactly what one wanted, as far as one was able, and then no difference would be likely to arise between the builder and architect. How builders could really make estimates on some general specifications he failed to see. In such a case it generally resulted that the man who got the job could not carry it out at a profit if the architect were at all strict, and if he were not strict, he was in the awkward position of not doing his duty by his client. He would suggest that there was a very good opening for a young man who was going in for the subject to write a handy little book upon it, for he did not think that a really good one was to be obtained anywhere. Mr. Woodthorpe concluded by moving a vote of thanks to Mr. Pinks and Mr. Holloway.

Mr. F. Hooper seconded the motion, adding that he would like to include Mr. Fletcher's name for his kindness in reading Mr. Pinks' paper. The function of the specification was, he went on to say, to secure a clear understanding between three parties—the employer or client, the architect, and the builder. It must be recognised that it was not only the builder who might try to evade the specification. He had heard builders complaining bitterly of the way their specifications were interpreted, and, he believed, with some justice. If architects were to have that intercourse with builders that Mr. Holloway suggested, he was of opinion that these matters of right understanding would be more easily arrived at. He was interested to hear from a builder that the cost of work often depended upon who was selected as clerk of the works. He believed it was also the case with architects. Some architects were much more strict than others, and would have the work carried out according to their specifications, and tenders were affected accordingly. And, again, novices whose specifications could not be easily understood, and whose drawings were vague might also expect to get high tenders. Simplicity should be their aim, and to write an illegible specification seemed to him very cruel. Indexing and side headings were useful, and it was a great convenience to builders to have the matter typewritten. The speaker deprecated the use of the word "properly," in describing the manner in which work should be done, holding that it was extremely vague, and that it created an excuse for all sorts of disputes.

Mr. H. W. Pratt considered Mr. Pinks had taken a very bold course in advocating the abolition of specifications. Had that gentleman suggested that the quantity surveyor should write the specification he should not have been at all surprised, although it was true Mr. Pinks seemed to think that architects, builders, and quantity surveyors hated them. Why the work should be such a drudgery he could not see. His own idea was that those who spoke most of the irksomeness and drudgery of it were those who knew least how and what to describe. It appeared to him unnecessary that specifications should be written in great detail, and he thought they owed it to quantity surveyors more than anybody else that they were often so written. He objected altogether to quantity surveyors writing architects' specifications—architects should write them themselves. Mr. Pinks' idea of a drawing being a specification also was a very good one to a limited extent, but it would be impracticable to put all the notes on an eighth-scale drawing, and however much they might take care of a drawing on the building, those notes would certainly be more or less obliterated before the job was half finished. To put scantlings of timbers on a drawing was a good idea, but to put on descriptions of plaster work and finishings and a host of things like that was quite out of the question. It would be quite as easy to get all those details from the specification as from the drawing. He was in favour of an abridged specification, and putting as much as they reasonably could on the drawing. If the specification were abolished the quantities would have to be the specification quite as much as the drawing, and they would accordingly be half as long again as under ordinary circumstances, while the whole matter would be so split up that he did not think it would be acceptable to anybody. As to the differences between drawings and specifications to which Mr. Pinks alluded, he (the speaker) was of opinion that there should be none. The two should agree, and if they did not it was sheer carelessness. He did not concur in the remark of the last speaker that typewriting should be adopted for specifications, because several copies of one document were often required, and blunders were so frequently made by typists in copying the figures.

Mr. C. H. Brodie was of opinion that Mr. Pinks's paper was full of fallacies. That gentleman said specifications were a great deal too long. He (Mr. Brodie) was bound to say that quantity surveyors' specifications were often a great deal too long, but he had never had a complaint brought against a practical architect's specification. He did not know what sort of building Mr. Pinks took a hundred pages to describe. Having urged that specifications should be carefully tabulated, Mr. Brodie said the question had been asked, Which was the more important, the drawing or the specification? They were one and the same to him; he did not see how one could be more important than the other. Another of Mr. Pinks's points was that the drawing should state which windows should be open and which fixed. He had seen a good many drawings, and most of them showed this—they certainly would not look at a specification to see that. The speaker alluded to other contentions of Mr. Pinks's as to details which should be shown on drawings, pointing out that it was the common practice to proceed on the lines suggested. Adverting to Mr. Holloway's paper, he expressed pleasure that that gentleman had dealt with the question of timber, and he advised those who had not had much experience in the selection of timber to apply to a merchant for a table showing the imported sizes. They would then not fill up their specifications with perfectly absurd sizes which would be very expensive. Reverting to Mr. Pinks's paper, he contended that it would be impossible to abolish specifications, for all the points that needed atten-

tion where alterations were being carried out could not possibly be shown on a drawing. He described type-written specifications as a perfect horror, favouring the process of lithography where several copies were required. In conclusion, he earnestly appealed to Mr. Holloway and those associated with him to get settled those conditions of contract which had been shilly-shallying about for so long between the Institute of Architects and the Institute of Builders. He was of opinion that the insertion in contracts of conditions thus adopted would save many builders having to refer to solicitors contracts with architects for whom they had not previously worked. Much valuable time would thus be saved.

Mr. J. C. Stockdale said his idea was that Mr. Pinks, in referring to specifications of 150 pages in length, had created a giant for the purpose of slaying him afterwards. He personally had seldom seen a specification which exceeded thirty or forty pages, and had never known a lawsuit follow on the use of a specification of that length, nor could he remember any arbitration in connexion with one. It was quite possible to carry out work with a specification of ordinary dimensions. Mr. Pinks spoke of specifications and drawings not agreeing; that would be more likely to occur where a quantity surveyor wrote the specification; there was only one person who knew what he wanted, and that was the architect who had the work in hand. As to quantities being made part of the contract, he did not see why they should not be, because frequently they were the basis for settling deviations at the end of the job. Mr. Holloway fell foul of the covering clause, but unless the specification was made of an inordinate length they could not well avoid putting that in—they could not specify everything. Concerning timber, Mr. Holloway had said that a little sap-wood might be permitted; he (Mr. Stockdale) thought a great deal rested on definitions, and what the builder considered "a little," the architect might think a good deal; the safer plan was for the architect to specify "no sap-wood," he could then use his discretion about passing any when the work was proceeding.

Mr. Simpson said he was glad, for Mr. Pinks' sake, that he was not present, as he had been so tremendously sat upon. He mentioned a case which was proceeding at Birmingham, in which the specification had been done without, the quantities being referred to for a description of the building. The quantities did not state where the different sorts of facing were to go, and litigation was the result.

Mr. Max Clarke said that upon one occasion he wrote a specification on a drawing. It was not illegible, but it took far more time than would have to be expended on an ordinary specification, and it looked extremely ugly. That one effort of his taught him that such a course was entirely unsatisfactory. As to the length of a specification they might have one which was quite moderate at 130 pages, and one which was immoderate at 30 pages. There were specifications and specifications. They depended entirely on the building. For a 20,000*l.* job, a 20-page specification would not exactly answer. He believed he was right in saying Mr. Pinks had had some connexion with people in Scotland. Scotch bills of quantities were very lengthy documents, prepared on a very different principle from that adopted in London, but in very few instances did they give the position of the materials; so if they referred again to the 20,000*l.* job, the bill of quantities would have to be 500 or 600 pages long to combine specification and quantities, and several lithographed copies of it would cost more than the architect's commission. The only occasion on which he had heard the word "proper" used was in connexion with door-frames and window-frames, and he believed there was an acknowledged section which was a proper door-frame, as also with a window-frame. It was important that the conditions of contract should be settled without delay, and he hoped pressure would be brought to bear upon the parties who were holding back. The speaker urged that all their arrangements with contractors should be in writing, and that typewriting for specifications was very dangerous, as the operators sometimes left out whole paragraphs.

The President said he understood there was a member of the firm of Messrs. Simpson & Co. present. Perhaps he would take part in the discussion.

Mr. Lough, responding to the invitation, suggested that the members should winnow the chaff from the wheat in both papers—even in Mr. Pinks' there were some valuable suggestions. If they placed all their details on the drawings, he thought architects would have to adopt larger drawings than at present, and the number of sections would have to be multiplied by six. In his opinion, builders had a slight grievance owing to the length of specifications, in many instances, and architects could very well specify on the drawings a great deal of what they wanted done. If that were done, a short concise specification would be the result. He was with Mr. Holloway in every item except that he did not see the necessity of attaching conditions to every specification. The more architects and builders got together the better it would be for themselves and their work.

The President said he was prepared to defend Mr. Pinks' paper in the absence of that gentleman. He was bound to say he saw nothing in the paper to object to, and a great deal of the criticism upon it arose from the fact of it not having been sufficiently carefully listened to. Mr. Stockdale showed the cloven hoof when he said "You cannot specify everything," and so you might be able to "do all your specifying in about thirty pages." But if they specified anything they ought to specify everything, and then they could not confine themselves to thirty pages. The length of specifications was quite a comparative thing. They might be able to specify the whole work of a 20,000*l.* warehouse in twenty pages, and it might take a hundred pages to specify for a 3,000*l.* house. It depended on the quality rather than the quantity of work to be done, and the variety of the detail. For a building with twenty-five or thirty different sorts of doors, twelve or fifteen different sorts of pavement, and twelve or fifteen different sorts of glazing, they could not do with less than one hundred pages. It was his custom to make as many notes on the drawing as he possibly could—that course saved both the builder and themselves a lot of time. It was true that Mr. Pinks had had a good deal to do with Scotch work, and no doubt that accounted for several of the opinions he had offered. To do away with a specification altogether was a very bold suggestion, and one he should not care to fall in with, because no matter how carefully the quantity surveyor took out his quantities, and how carefully the architect figured and noted the drawings, there must be many things that could only be properly said in a specification. The President deprecated the use of books by a young architect for the purpose of helping them to write a specification. He should find out by experience what he wanted, and it was the fact that he did not know what he was specifying that led to the general clauses that had been referred to. He had hoped to hear more than he had done as to how far an architect ought to go into trade terms. He had recently specified "best picked stocks" for facing, but the bricks used were not good enough to satisfy him, and he was then told that he ought to have specified "shippers," which were the best kind of stocks. Mr. Pinks said that in some cases they needed to put "extra super best" when they wanted the best, but he (the President) thought an architect might put at the beginning of a specification that when he said best he meant it. With regard to what Mr. Holloway had said on the subject, he considered it impossible for any man to have a sufficient knowledge of timber to specify exactly what he wanted. Sizes of timber were constantly varying.

The vote of thanks was heartily accorded.

Mr. Holloway, in reply, said that if he had brought out any useful hints he was quite satisfied. Although he totally disagreed with Mr. Pinks in one or two of his arguments, he thought that gentleman had not been treated with quite that justice which he deserved, some of his suggestions being well worth considering. When, however, Mr. Pinks argued that a builder did not know much about drawings, he was arguing against himself, for the builder would be more confused if all the details which should be mentioned in a specification were added to the drawing. Mr. Pinks' whole aim seemed to be to underrate the specification. He (the speaker) on the other hand wanted to raise it to a higher level. It should be quite equal in importance to the drawings themselves. He had been under the impression that conditions of contract had at last been settled, but he heard with regret that this was not so. From the point of view of the builders, the architects were a bit pig-headed about the matter. He trusted that when the conditions were finally agreed upon the architects would loyally adopt them in all contracts. He advised young architects to get practical experience by spending a fair amount of time upon buildings while in course of erection, and referring to the course of preparation of specifications, he mentioned that he preferred them in ordinary writing to typewriting. Mr. Holloway impressed upon architects the importance of only specifying materials which could be obtained and work which it was possible to do; and on the question of timber he pointed out that a little sap on timber so long as it was exposed to the air did not cause it to rot as many clerks of works thought it did; they must, however, use discretion in avoiding the use of timber with sap under certain conditions.

The proceedings then terminated.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

ST. PETER'S CHURCH, EALING.

The sixth spring visit was paid on Saturday last to St. Peter's Church, Ealing, the late J. D. Sedding and Mr. H. Wilson, architects. The party were met by the Vicar, the Rev. W. Petty, who conducted the members over the church, thereby adding largely to the interest of the visit. The church has been illustrated by us,* and is well known as one of Sedding's latest efforts.

Internally, the striking features are the three widely-spaced piers of the nave, to which is attached a semi-circular shaft, which is carried up and supports a tie-beam. These nave piers are connected by flat segmental arches springing from the side of the piers and supporting the triforium arcade. The tower will eventually occupy the north transept, the nave piers being strengthened to carry it. On the north side of the west entrance formed by the setting back of the great window occupying the west front is the baptistery, the corresponding recess south of the entrance being used as a waiting space. The southern of the two oblong towers which flank the west window is used as a staircase to the triforium, which serves as a gallery to be used on special occasions. The sacristy and clergy vestry form the north choir aisle, over which is the organ-gallery. On the south of the choir will eventually be placed a larger vestry, connected with the northern one by means of a passage under the great east window.

The choir is paved with Irish marbles, and is well raised above the nave, from which it is divided by a low wall of Box Ground stone banded with Devonshire soap-stone, a kind of serpentine not polished, but simply oiled. The roof, which is continuous over the nave and aisles in one slope, is treated, as far as the nave is concerned, as a simple collar-beam type, with the addition of extra struts, forming a semi-octagonal outline, and coloured in two shades of blue. A tie-beam is carried across, supported by the pier-shafts, where these occur. The lower part of the nave piers are panelled in wood, and coloured a bright blue. The seating is effected by fixed seats of simple design in the nave, stained dark green and French-polished. The aisles have chair-seats. The western and northern doors are solidly framed, and covered with light brown leather, and faced at intervals with brass worked with flowing patterns. The bronze figure of an angel, which occurs in the centre of the west door, is by Mr. Pomeroy. A striking feature in the interior is the absence of the stock Gothic mouldings, and the use of bold broad splays in their place. Externally, the church is constructed of yellow stock bricks, Box Ground stone being used as a facing for the more important parts. The main roof is covered with grey slates.

The west front, with its immense window of flowing tracery, flanked by the solid-looking towers, is characteristic of the late J. D. Sedding's work.

The feature of the main roof is that the piers to the nave are carried through it and covered with ogee copper roofs. Between these the line of the triforium shafts are carried through, and will eventually be crowned by statues. All these piers are connected just above the roof-level by flat segmental arches, which help to break the lines of the great single-span roof, covering nave and aisles. There are no clearstory lights in consequence, but abundant light is obtained from the great west window, of the Sloane-square type, and from a continuous range of lofty aisle windows.

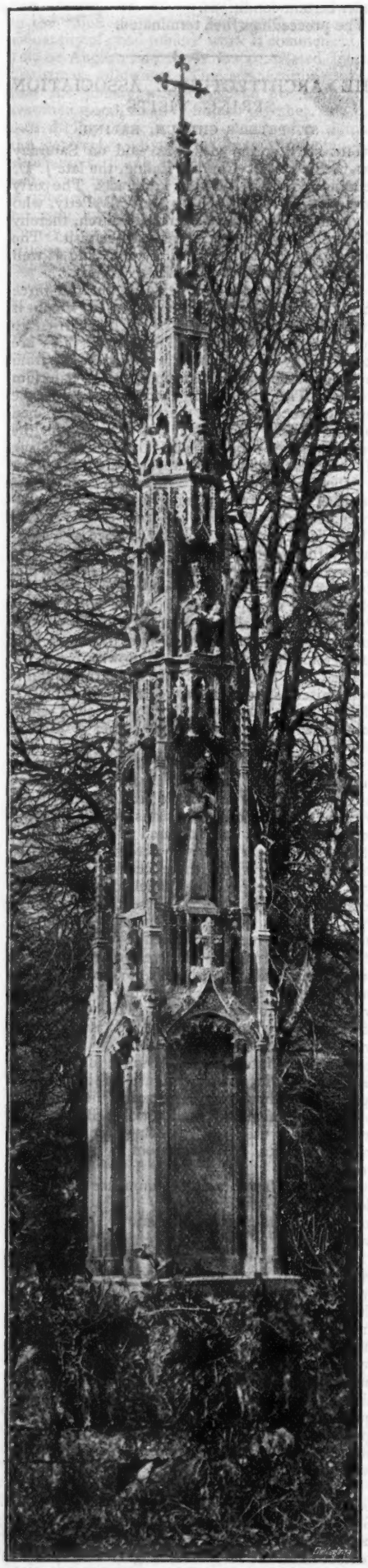
After thanking the Vicar for his courtesy in being present, the party, at the invitation of Mr. Shuffrey, proceeded a short distance to inspect his house; charmingly fitted up by himself, and perfect in all the internal arrangements. Tea was

* See the *Builder*, November 16, 1889.

then provided for the members by Mr. Shuffrey, bringing to a close an instructive and enjoyable afternoon.

THE BRISTOL HIGH CROSS, STOURHEAD, WILTS.

THIS beautiful and interesting structure was first erected in 1373, at the intersection of the four principal streets of Bristol (where a former "High Cross" stood, as mentioned in a MS. calendar of 1247), to commemorate the separation of Bristol from Gloucester by a Charter granted to the burgesses by Edward III. It then probably consisted of a lower open stage with angle-shafts and a central core, with groined canopy supporting a base of tabernacle-work, with corbels for the erect figures of former royal benefactors to the city. Pooley, in his "Crosses of Gloucestershire," 1868 (his information is apparently gleaned from Barrett's "History of Bristol," 1789), describes these effigies as—on the north, John (facing Broad-street), on the east, Henry III. (Wine-street), on the south, Edward IV. (High-street), and on the west, Edward III. (Corn-street); and states "that of Edward IV. was added, afterwards, to the other three figures," but it seems improbable that the Cross would have been left with only three figures, and it is more reasonable to suppose that this represents some other King (possibly Edward I. These figures were divided by the angle shafts, and were surmounted by traceried canopies, the whole terminating in a shaft with a canopied head containing either two or four sculptured subjects. As in the case of most other crosses, the latter portion was doubtless destroyed in the religious troubles of the sixteenth century.



Old Bristol High Cross, set up at Stourhead.

In 1633, repairs being found necessary, very important additions were made to the Cross, at a cost of 207*l.*, consisting of another tier of effigies with canopies, then a stage of heraldic shields with cherub supporters, also under canopies, and a crocketted spirelet, thus raising the height of the structure to 50 ft. The addition was made with great judgment as to proportion, and it is interesting to compare the Carolian Gothic work (intermixed as it is with contemporary ornament) with the beautiful detail of the original. The effigies were seated, and represent later Royal personages, who had either granted or confirmed charters, viz., Henry VI. (eastward), Elizabeth (westward), James I. (southward), and Charles I. (northward). The structure was further enriched by colour and gilding, and this was repeated in 1697.

In 1733 it was removed as a "dangerous erection," at the instance of a silversmith living near, and its stones thrown by in the Guildhall, whence it was rescued and re-erected on College Green shortly after.

But in 1763 the Cross, by "interrupting gentlemen and ladies from walking eight or ten abreast" (Barrett's "Bristol," 1789), again gave offence, and was finally taken down, the stones being afterwards given to Mr. Henry Hoare, of Stourhead, who erected them in his park (in 1766) at a cost of 300*l.*, adding a large core of masonry in the place of the central shaft of the lower stage for greater stability, and surmounting the whole by a cross of copper. The wide reputation of his son, Sir Richard Colt Hoare (to whom this work is generally attributed), has overshadowed the very manifest antiquarian tastes and capabilities of Mr. Henry Hoare as evinced in this and the similar work of removing to Stourhead, in 1765, the building known as St. Peter's Pump from the south-west corner of Peter-street, Bristol (where in 1633 it superseded the ancient openwork cross erected by Spencer, Mayor of Bristol, in 1474). This he erected on a site about a mile higher up the valley, at the extreme source of the River Stour. It is not recorded how these two relics came to be presented to Mr. Hoare; the fact proves that his influence at Bristol was considerable.

Unfortunately, in his zeal to make his rebuilding of the cross complete, Mr. Hoare made the great mistake of using *iron* for dowels, cramps, and tie-rods—a central rod of iron being carried through the spirelet and the core of the upper stage. This has had the most disastrous results—the stone being split and fractured in all directions, and this, with other injuries caused by the fall of a tree in recent times, rendered the condition of the structure most critical when the present baronet, Sir Henry H. A. Hoare, succeeded to the estate in July, 1894. One of his first acts of ownership was to consult Mr. C. E. Ponting, architect, of Marlborough, under whose care extensive repairs have now been carried out in a thoroughly conservative spirit, no old stone which could in any way be retained has been removed, and all new stones carefully copied from the parts which were lost. The surface of the old work has been in no instance cleaned or in any way altered.

The work has been carried out by Messrs. Harry Hems & Sons, of Exeter, with the result of placing the Cross in a perfectly secure state. The following inscription has been placed on the base to commemorate the various epochs in the history of the cross:—

The Bristol High Cross.

Erected in High-street, Bristol, 1373.
Restored and one stage added, 1633.
Taken down in 1733, and shortly afterwards erected on College Green, Bristol.
Again taken down in 1763.
Given to Henry Hoare, Esq., of Stourhead, by whom it was removed and erected here, 1766.
Restored by Sir Henry Hugh Arthur Hoare, 6th Baronet, 1895, it having then fallen into a most dangerous condition.

SOME FURTHER NOTES AT THE BUILDING EXHIBITION.

CONTINUING our notes of the fitting and furnishing of buildings from last week, we may note that the Fireproof Construction Company, part of whose exhibit we noted last week, claim that their hygienic cement partitions, of hollow form, are one-fifth of the weight of 4½-in. brick-work, and that, by the interlocking system of construction, they are rendered perfectly self-supporting, which we should consider very probable, seeing that the whole partition is bound together to form one solid mass; this renders it useful, as it dispenses with the need of an iron joist. The system has been found to be sound-proof, and has been used in cubicles in music-schools for this purpose. Other exhibits of this company are the fireproof hygienic effluescent cement, whose special quality is quick drying and freedom from acid.

The "Shepwood" patents for the protection of iron-work from fire are worthy of inspection. The system can be applied to partitions and floors. In the partitions, they do not vary much from the other hollow concrete structures described, one feature being that the hollow spaces are continuous vertically. The Shepwood floor consists of arched tiles formed to fit round the flanges of the joists.

Mr. Wiseman exhibited several improvements in door and window-fasteners. One of these admits of the sash-windows being allowed to remain open, while at the same time being locked. The "Reliance" Door-Stay, by the same exhibitor, is practically a substitute for a door-chain, on which it is an improvement. The "Reliance" Picture-Hanger consists of a long double-jointed rod, which, by means of a screw-joint, can be lengthened at will. It is an improvement on the use of picture-cord or wire for this purpose, and is in itself not unsightly.

The Expanded Metal Company had a special position to show the several applications to which this useful material can be put. Its principal qualities are that it is light, strong, and rigid; it forms an excellent key; will bend to any shape or position; is useful as a backing for cornices; and, when galvanised, forms a good and cheap window-guard for churches, &c. Its wonderful adaptability for every purpose in which wood-lathing was formerly used is its chief merit.

The Incandescent Gas Co. had a good display of their important invention. Their new form of burner has already been alluded to by us some-time since. The by-pass which is now exhibited is a distinct improvement, as it not only saves the "mantle," but the burner is visible, when turned down, on entering the room. The "Surprise" pendant, which allows the gaselier to hang at any height or angle, is an ingenious contrivance. As the "mantles" can now be fitted by anyone this invention should have a future.

Parham's "Perfection" Glazing is a system of patent glazing with wood bars and springs, somewhat similar to the patent iron systems.

Messrs. King & Smith's "Honeycomb" wine-bin should be noted by architects. It consists of hollow terra-cotta tubes, hexagonal externally; into these the bottle is placed. They compare favourably with iron wine-bins, and are cleanly and easily fixed.

Messrs. Anderson, of Belfast, exhibit their felt and silicate cottons, which are of use as sound deadeners, &c. The patent hair-fabric, for winding round water-pipes against external walls, is a useful material, and easy in application.

Callender's Bitumen Co., Limited, show their pure bitumen damp-course and bitumen sheeting. This sheeting is made in various withs for walls, and in long lengths, and the lapped ends become hermetically sealed by the pressure of brickwork. The price compares favourably with the leading asphalte damp courses. It has been used throughout the Tower Bridge and other large works, and is recommended by some of the leading engineers.

Machinery.—Although it cannot be said that

the makers of machinery availed themselves very largely of the opportunities offered by the Building Trades Exhibition, to bring before the public any novelties in their several specialties, yet, taken as a whole, the Agricultural Hall contained much that is worthy of the attention of those engaged in many of the more important industries of the country. The exhibition of wood-working machinery by Messrs. J. Sagar & Co. (Halifax, Yorks) included machines for tenoning, cross-cutting, &c., and for many other purposes of a similar nature. Their planing-machine, which planes the top surface and both edges at one operation, will recommend itself to those using such tools, since besides being capable of dealing with work from $\frac{1}{16}$ in. to 5 in. thick, and 24 in. in width, it embodies several recent improvements of importance. This firm also show band-sawing machines with 30-in. saw-pulleys, and a circular-saw-bench of improved pattern, with rising and falling table suitable for saws up to 18 in. diameter.

Spear's "Expert" chain mortising machines, shown in another part of the Hall (Bay No. 14), also require to be specially mentioned, and the specimens of the work these are capable of performing show that there is now but little room for improvement in this class of machinery.

The makers of gas-engines, although, perhaps, not so numerous as formerly, were nevertheless well represented. Among these Messrs. Crossley Bros. (Manchester) exhibited an engine of 14 h.-p. nominal, capable of indicating 40 h.-p., and giving a brake of 33 at a speed of 170 revolutions per minute. This engine was used for driving the brickmaking machinery of adjacent exhibitors. An engine of 7 h.-p. nominal, giving a brake of 13 h.-p. at 180 revolutions per minute, and another of 3 h.-p. nominal, giving a brake h.-p. of 6 at 200 revolutions per minute, were also shown by this firm; both of these contain several recent improvements. Gas-engines on the "Otto" principle were shown by Messrs. Tangy, Birmingham, and this firm's exhibit of lifting apparatus, such as hydraulic jacks, rope and chain blocks, and various other gear necessary for building work, was also important, since this class of work is one of their specialties, and its value can hardly be overrated when the safety of the men employed in building operations, combined with expedition, are sufficiently considered. Such appliances were, however, very well shown by the Pickering Block and Hoist Company, Clerkenwell, who exhibited various patent pulley blocks, quick sack hoists, warehouse hoists, and other similar apparatus, capable of dealing with moderate weights.

As a contrast to this light class of machinery the powerful brick-making machine shown by Jefferies (Stroud) may be mentioned. The clay issues from this machine in a stream which is accurately cut into bricks by an automatic cutting-table capable of cutting from 4,000 to 5,000 per hour.

Among others of a like nature, the machines exhibited by Messrs. Pullan & Mann (Leeds), and those by Messrs. T. Middleton & Co. (Southwark), should be especially mentioned.

No doubt both engineers and architects will have found most interest in examining the cement-testing machines, and the specimens shown by Messrs. H. Faija & Co. (Westminster), and the samples of tested products used in building shown by Messrs. Kirkaldy & Sons (Southwark). These were all shown for the first time in connexion with the Building Trades Exhibition, but their value is now so fully demonstrated that it is to be hoped similar exhibits will always be included in the future.

BUILDING TRADES EXHIBITION.—By a press error which escaped our notice the name of Messrs. W. Harriman & Co., of Newcastle-on-Tyne, was incorrectly printed in our last as "W. Harrison & Co.," in our reference to their exhibit.

CARPENTERS' HALL LECTURES:

WORKS OF THE MANCHESTER SHIP CANAL.

THE fourth of the recent series of lectures given at Carpenters' Hall was delivered on Wednesday, the 27th ult., by Sir E. Leader Williams, his subject being "The Works of the Manchester Ship Canal." Sir Albert Rollit, M.P., occupied the chair, and introduced the lecturer.

Sir Leader Williams commenced by referring to the early history of Canals, which was a matter of some interest. The advantages of inland navigation were obviously so great, that the Royal Canal in China was constructed as early as the year 980. Its length was upwards of 825 miles, with many branches in addition to the main canal, and it occupied 30,000 men for 43 years in construction. The Suez and Corinth Canals almost traversed the same ground occupied by early canals ot smaller size. In England the Roman constructed canals, one of which, the Foss Dyke Navigation, was still used in connecting the River Witham at Lincoln with the River Trent at Torksey. The introduction of locks enabled canals to be constructed through a country requiring different levels, thus saving great cost in excavation. There was some doubt as to the date of their introduction, but flashes in rivers were used before locks were invented, which appeared to have been in Italy in the fifteenth century. In 1481 two brothers named Domenico, of Viterbo, watchmakers, designed a chamber with a double pair of gates for canals, and it was adopted in the Martesana Canal. The Ship Canal to Manchester was brought about owing to the indomitable pluck and courage of the Lancashire people, and he could speak the more strongly about that as he was a Worcestershire man. He prepared his first plans for the concession in 1883, and previous to that Mr. Fulton, the well-known engineer, had propounded the tidal scheme, which was abandoned. Three severe Parliamentary contests followed, when powers were obtained to carry out the work. In the Session of 1883 the Bill passed the House of Commons, in 1884 the House of Lords, and in 1885 the Act was obtained, as it passed both Houses in the same Session; thus the Ship Canal obtained the approval of both Houses of Parliament twice over during three successive Sessions. The original scheme was to utilise the tideway of the Mersey to Runcorn, whence a locked Canal passed inland near to Warrington, and then up the Mersey and Irwell valleys to Manchester, but the strong opposition of Liverpool to the tidal portion of the scheme caused the promoters to adopt a plan by which the Canal was carried along the Cheshire side of the estuary. It was originally proposed to have the Canal 20 ft. deep and 100 ft. in width at bottom; but experience proved the advantage of the increased size adopted, namely, 120 ft. bottom width, and 26 ft. depth, without which the largest class of vessels could not have used the Canal. The lock sills were 28 ft. below ordinary water level, to allow of dredging to that depth if necessary. The soil through which the Canal was excavated was of a varied character, there being hard and soft sandstone rock, boulder and other clays, gravel and sand, loam and silt, alternating in layers, without any regularity either as to position or depth. At Latchford, within a short distance in the heavy rock cutting, the rock altogether disappeared, and was not found by a boring sunk 100 ft. below the bottom of the Canal, although the canal had been cut through the rock for a mile close to either side of the boring. By utilising the valleys river water was obtained, and the railways were taken over the Canal at a much less cost than by any other plan. For the first three years, when the late Mr. Walker was carrying out the work, no floods of importance occurred, but as soon as the company took possession of the works great floods ensued, causing great delay and cost. Stone was used from many quarries in Cornwall, Wales, Yorkshire, and Cheshire, and bricks were made on the works, while by adopting Portland cement concrete for the main part of the walls of docks and locks, it was possible, with the assistance of 230 miles of railway, 173 locomotives, and 6,300 trucks and wagons, to complete the work in a reasonable time. It was considered that the work might be finished in from four to five years, but owing to the unforeseen difficulties and delays it took six years to complete the Canal. For the excavation nearly 100 steam-excavators of various types were employed, some of which were constructed in France and Germany. There were 194 steam cranes, 182 portable and other steam-engines, and 209 steam-pumps employed, consuming about 10,000 tons of coal per month. The total amount of excavation in the Canal and docks amounted to about 50,000,000 cubic yards, 10,000,000 cubic yards of which were sandstone rock. The entrance locks at Eastham were three in number, their size being respectively 600 ft. long by 80 ft. wide, 350 ft. by 50 ft., and 150 ft. by 30 ft., while, in addition, there were two sluices of 20 ft. wide each, to assist to fill the Canal. This group of locks could admit a large amount of shipping every tide, more particularly as on all tides above the ordinary level of the Canal all the lock gates were open for a considerable period before high water. Spring-tides rose 5 ft. to 7 ft. above the ordinary level of the tidal portion of the Canal, which extended to the next group of locks at Latchford, a distance of twenty-one miles. The total length of the Canal was 35½ miles, and from Latchford to Manchester, a distance of 14½ miles, it was filled with the waters of the rivers Mersey, Irwell, Bollin, and Glazebrook. The Canal being designed to take the place of the rivers Irwell and Mersey from Manchester to Latchford, it thus became a canalised river, continuing to be the main drain for Lancashire and Cheshire, and large sluices were provided at each set of locks to deal with land floods and surplus water. The river Weaver embankment penned the water up the river to Frodsham, a distance of three miles from the Canal, thus forming a large sheet of water available, after dredging, as a dock, for vessels of any size. This large dock was joined to the Weaver Navigation by a lock 229 ft. long by 42 ft. wide, which admitted the salt trade of Cheshire to the Ship Canal. Large locks were also built in the embankments at Weston Point and Runcorn, to allow coasters and barges to enter and leave the canal. At Ellesmere Port there was an embankment faced with stone, one mile in length, across an embankment of the estuary. On each side of the foot of this embankment close timber piling had been driven, no less than 13,000 pine piles 13 in. to 14 in. square and 35 ft. long, having been driven through sand without any trouble, by the use of the water-jet principle. At Latchford the locks were two in number, the larger being 600 ft. long by 65 ft. wide, and the smaller 350 ft. long by 45 ft. wide. At Irlam, 7½ miles above Latchford, similar locks were constructed, as well as at Barton and Mode Wheel. The last-mentioned locks formed the entrance to the Manchester Docks. All the lock gates were constructed with green-heart, a very hard wood imported from Demerara, which had been found by experience to be extremely durable. Being of wood, they were less liable to damage than those made of iron, being less easily affected by vessels striking them. The gates were worked by hydraulic power, provided at each set of locks, the engines and machinery having been constructed by Messrs. Sir W. G. Armstrong, Mitchell & Co. Near Warrington, where the lines of the London and North-Western and Great Western Railways crossed the Canal, they were raised by the construction of high-level deviation railways, so as to allow the shipping to pass under the railway bridges. The railways between Warrington and Stockport and the Cheshire Lines, near Irlam, had similar deviation railways at a high level, the total length of railway deviations being 11¼ miles. The railway viaducts were in most cases considerably on the skew, and the clear spans of the openings varied from 266 ft. to 137 ft., these large spans being necessary to enable the full navigable width of 120 ft. being maintained for the Canal. There were two high-level road-bridges and six swing road-bridges between Runcorn and Barton, the spans being in all cases not less than 120 ft. The swing-bridges were worked by hydraulic power, as well as the movable aqueduct, which would enable vessels with fixed masts to pass through the Bridgwater Canal at Barton. This work had two openings of 90 ft. each, crossed by a large iron caisson resting on a central pier. This caisson was filled with water to the same depth as the Bridgwater Canal, and boats passed along it over the Ship Canal. When vessels on the Ship Canal had masts too high to pass under the caisson it was opened like a swing-bridge, the water being retained in the caisson by gates at each end. Similar gates were used at each end of the aqueduct leading to the movable caisson, to maintain the water in the Bridgewater Canal. The docks at Manchester had an area of water-space of 114 acres, the area of quay space being 152 acres, and the length of quays 5¼ miles. At Partington the Canal was widened out to allow steamers to lie on either side, and branch railways were constructed, with hydraulic coal-tips, to enable either Lancashire or Yorkshire coal to be expeditiously loaded for shipping. Steamers were able to navigate the canal by day and night, and the time taken averaged seven to eight hours, passenger steamers even taking considerably less time.

The lecture was copiously illustrated by excellent lime-light views, and at the close a cordial vote of thanks was passed to the lecturer.

ENGINEERING SOCIETIES.

INSTITUTION OF CIVIL ENGINEERS.—The list of members of the Institution of Civil Engineers just issued contains the names of 1,862

Members, 3,687 Associate Members, 355 Associates, 17 Honorary Members, and 816 Students, together 6,737, being an increase at the rate of 2¾ per cent. in the past twelve months.——At the ordinary meeting of the Institution, on the 2nd inst., Mr. W. H. Preece, C.B., Vice-President, in the chair, the paper read was on "Torpedo-Boat Destroyers," by Mr. John I. Thornycroft, F.R.S., and Mr. Sydney W. Barnaby, MM.Inst.C.E.

Illustrations.

NETLEY ABBEY.*

THE first monks of Netley came from Beaulieu Abbey, in the New Forest, and were Cistercians, a branch of the Benedictine order, and trustworthy records testify that the site for their sister Abbey of Netley was acquired by Robert, the first Abbot of Beaulieu, in the year 1235.

The Abbey was built at the suggestion of Sir Peter de Rupibus, or De La Roche, who was a zealous founder of monastic institutions, and was Bishop of Winchester in the early part of the reign of King John, and held that see until his death in 1238. It is probable that it was his influence with the King—whose tutor he was—that procured for the Abbey the Charters in the middle of the thirteenth century, granting land in Surrey and elsewhere for the benefit of the Abbey.

It appears probable from examination of the histories of these early grants that some earlier buildings than any of the remains of the present structure existed when the present Abbey was built, and it is conjectured that its foundation, about which there is much speculation, was due to the patron saint of Westminster, Edward the Confessor, which conjecture is confirmed by the fact of the arms of the Confessor (a cross, glong, and four martlets) being found upon one of the fosses to the vaulting of the south transept.

Netley shared in the general suppression of Abbeys instituted by Henry VIII., at which time an old authority says that the inmates consisted of twelve monks and an abbot, and its annual revenue of the value of 160*l.* Originally a monastery for Cistercian monks, it remained such for 300 years, and after the dissolution was granted by Henry VIII., with the manor of Howndes and farm, to Sir William Paulet, afterwards first Marquis of Winchester, who converted the Abbey into a private residence for his own use. These important alterations, which naturally did so much to destroy the Abbey still further, and lost such a wealth of Gothic work, are to be distinguished to-day by the square-headed windows, the use of red bricks in the construction, and a fine description of sand used in the mortar. Later on in its history it became, about the middle of the sixteenth century, the seat of the Earl of Hertford, and, in 1700, the property of Sir Berkeley Lucy. Until that time the church was practically entire. The materials were then sold by him to a builder of Southampton, named Taylor, of whom there is a quaint local legend.

It is said that after Taylor had concluded his contract, some of his friends warned him against touching the remains of the Abbey, saying they would never themselves be concerned in the demolition of holy and consecrated places. Their warnings appear to have impressed Taylor greatly, who dreamt that, in taking down the roof of the church, the keystone of the arch above the East window fell from its place and killed him. On relating this dream, he was again advised to have nothing to do with the pulling down of the building, but unfortunately for him, this advice was not followed, and it is said that Taylor's skull was actually fractured by a stone which fell from the window. This accident, however, had the effect of staying the destruction of the Abbey, and leaving it much in the same condition (allowing for time and weather), as it stands to-day.

The earliest part of the present ruins is undoubtedly that of the Abbot's house, which, as will be seen on reference to the plan, is situated a few yards from the East end.

There cannot, however, be very many years between the date of that portion and that of the Abbey itself; it is slightly earlier in character, as the filleted mouldings testify. There is now so little remaining of the original house that it is difficult to give, with any amount of certainty, names to the several apartments. The longer one might have been, and is usually termed, the hall, and the rooms over, judging from the better finish of the mouldings, the principal apartments.

In plan, the Abbey is of the usual cruciform type, with a nave of eight bays and choir and transept, each of four and three respectively, the side aisles of the nave being continued in the choir, but in the transepts the side aisles only occur on the eastern side. On a close examination of the aisles in the north and south transepts there are found to be indications of structures formerly existing there, and which were possibly chanting chapels.

The choir in plan has that slight inclination towards the south, not so marked as in some instances, which has been supposed to symbolise the inclination of the Saviour's head upon the Cross.

The east end, where the architecture is of a later and purer date than elsewhere, and freer from the influence of Norman work, must have been in its prime, as the present remains indicate, of great beauty and refinement of detail.

The east window, the centre of attraction of the Abbey, somewhat similar to the Chapter house at Salisbury, originally consisted of four lights, with a large centre foliated ring of eight foils, the smaller one being a quatrefoil of simple design. The jamb and arch mouldings are somewhat later in date than the rest of the work and have the peculiarity of the columns arranged smaller in size as they recede from the eye, this has the effect of giving greater apparent depth to the internal jamb of the window.

In comparison with the side aisles the nave is rather beyond the usual width, and the buttresses are noticeable for their unusual strength and depth of projection.

The buttresses at the west end have a small and unusual refinement of detail, which is well worth attention—viz., that the lower set-offs are steeper than the upper. On consideration, it will be seen that this is in reality the more scientifically correct treatment, as the line of pressure tends more towards the perpendicular as we approach the ground, though it is contrary to the usual design of Mediæval buttresses.

The groining of the transepts is later in date than that of other parts, and is especially worthy of remark, owing to the large and finely detailed stone brackets from which the groining springs.

It is evident, not only from the later work as shown in the detail of these brackets, but also from the insertion of the masonry itself, that the groining of the transepts was introduced after the other parts of the building were finished.

This portion of the Abbey is the latest period of its architecture, with the exception of course of the Tudor work of Sir William Paulet, before mentioned.

There is a noticeable difference in detail of the groining eastwards of the tower, where there is a double rib over each column, the space between the ribs being divided by panels with a carved rosette in each.

The spiral staircase, seen on the plan, at the north-east angle of the choir and south transept originally gave access to the triforium, and to a room over the transept groining. The three-light window of fine design still exists.

What remains there are of the doorway leading from the north transept to the sacristy indicate that it was of a somewhat elaborate character—that is, in comparison with the rest of the work. The same remark holds good with that in the east end of the south aisle of the nave.

The doorway shown in the centre of the south wall of nave is not of the same date as the rest of the work; but it is evidently of modern or comparatively modern introduction.

There are indications in the north and south wall, and in corresponding positions near to the east end, of an almonry or locker, with traces of the shelves and rebates for the doors. Near to the almonry, at the south wall, is a piscina, and there are remains of two others in the south transept.

At the west end in the northern aisle are the remains of a Purbeck marble block in the wall, which was evidently a position of a pedestal for holy water.

Adjoining the south transept is the sacristy, a room groined in three compartments, with two larger recesses originally used for the vestments, and two smaller ones, one a piscina and the other an almonry.

Over this groined roof is a small vaulted chamber, which was formerly used for nightly service, and was connected with the church by a small circular staircase in the south transept.

Beneath the west window, and on the north side of the altar, is a mutilated projecting stone, which was probably a bracket.

The cloisters (usually called "the Fountain Court"), of which there are now but a few remnants left, occupied the usual position on the south-west side of the church; they extended round to the south-west and north walls and part of the east. The lavatory was at the south-east corner of the cloisters.

What now remains of the Chapter House show it to be a most interesting example of thirteenth-century work. In plan it is square, and originally vaulted in nine compartments, with four central supporting columns. The three fine arches, deeply moulded with the round and fillet, deep hollows and a scroll moulding, are sufficiently illustrated in the lithograph view published in this number, in which also is seen one of the three beautiful Early English windows of two lancet lights with foliated circles in the head. Of the three arches on the west side, the centre one was the entrance, and those on either side were windows originally glazed, with four lights with traceried heads, similar in character to the east window of the choir.

The passage next the Chapter House formerly gave access to the Abbey garden and the Abbot's residence beyond. It is simply vaulted without groins.

The refectory, or dining-hall, was the compartment situated between the kitchen and the passage leading to the garden. Its dimensions are about 80 ft. by 25 ft. There is now but very little left of the original vaulting, and a large elm-tree grows in the centre of the hall. It was originally vaulted and groined in ten compartments, with four central supporting columns. Since it was first built, and probably when the inmates of the Abbey were much reduced in numbers, the refectory was divided in the centre by a stone wall, and in it were recently found imbedded the base and part of the shaft of one of the columns. The detail is similar to the columns of the church. The hall had originally a hooded fireplace, apparently somewhat like that of the kitchen.

The kitchen, the next compartment south of the refectory is, perhaps, after the Chapter House, the most attractive part of the conventual buildings. It is of the same period as the rest of the work, and the chief interest in it is the hooded fireplace on the north wall, which is a very fine specimen of Early English work. There are remains of brackets in the corners supposed to have been used for lights.

The kitchen measures 50 ft. long by 18 ft. 6 in. wide, not including the enclosed spaces adjoining the south wall. These enclosed places are supposed by some authorities to give weight to the supposition that the drain from the fish-ponds, which is immediately below, was originally a secret passage way from some Manor formerly existing to the north-east of the Abbey. These spaces have no connexion with the ground floor, but there is a small door over the kitchen which directly communicates with the drain. The small room at the south-east, having a hatch, was, in all probability, the dining-room, and the part immediately next it, the kitchen.

The buildings—or rather the remains of the buildings—on either side of the entrance, were erected in the reign of Queen Elizabeth, on what are apparently old foundations.

The centre portion formed the principal entrance, with an octagonal turret on each side for the gate-keeper or porter. At each end of the range of buildings are to be traced the foundations of a hexagonal turret for a staircase leading to the upper apartments.

There was formerly here no less than four fireplaces, and each fireplace is constructed with two flues. It has been suggested that this was done on principle, and that the double flue may be supposed to act as an inverted syphon, the draught passing down one flue and up the other, the preponderating draught upwards being in that flue opposite to the doorway or other principal opening.

The passage seen on the plan, next the Chapter House, formed a communication from the cloisters to the garden, and the ruined building beyond, supposed to be the Abbot's residence. This passage has a simple vaulted ceiling, without groins.

Next to the passage on the plan is the refectory, with three windows in the eastern wall. It measures about 79 ft. by 25 ft., and the groined ceiling, now entirely disappeared, was supported in the centre by a range of four circular columns.

* The series of the "Abbeys of Great Britain" is continued this month with illustrations of "Netley." Particulars of this and of the three Cathedral series ("England and Wales," "Scotland," and "Ireland") will be found on p. 272; also (on page i.) of the recent re-issue, in book form, of the series of English and Welsh Cathedrals.

All this work is contemporary with the rest of the Abbey, and the section of the base-mouldings to the columns of the groining is similar to those in the church itself.

There are recesses in the walls of this room.

BRASS OF THOMAS NELOND, A.D. 1433, COWFOLD, SUSSEX.

THE brass here illustrated lies in the Church of the Holy Trinity at Cowfold, Sussex, in commemoration of Thomas Nelond, who was Rector of the church and Prior of the Cluniac Monastery at Lewes. The figure of the Prior, in the dress of a Cluniac monk, is represented under a triple canopy, which is one of the finest and most elaborate known to exist amongst English brasses.

In the centre compartment is the Virgin with the Infant Saviour; on her right hand is St. Pancras (the patron saint of the foundation), and on her left St. Thomas of Canterbury, representing a beautiful little specimen of archiepiscopal robes. To each of the figures a prayer is addressed.

The Latin inscription round the margin records the name of Nelond, with the comment that he was a pattern and example of a holy life, "a Martha to the world and a Mary to Christ."

The illustration is from a rubbing by Mr. C. W. B. Bridson.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday, in the County Hall, Spring Gardens, Mr. Arthur Arnold, Chairman, presiding.

The Works Department.—Paragraph 11 of the Finance Committee's report was as follows:—

"We have had under consideration the charge which should be made to the Works Department for the proportion of establishment expenses incurred at the central offices, and also under other heads for the year 1894-95. The comptroller calculates the extra cost for salaries and expenses in his department for the current year, in connexion with checking and auditing the accounts and books of the Works Department, at 660*l.* Up to Ladyday, 1894, the Council paid a rent of 1,500*l.* a year for the central wharf, and this amount was of course charged to the Works Department, but the Council has, as from that date, purchased the freehold of the wharf, and new workshops and offices are in course of erection there. It has therefore been necessary to consider what charge shall be made for the interest on and repayment of original capital outlay. We have carefully gone into the question, and, having regard to the amount paid for the purchase of the central wharf and the outlay for works, have arrived at the conclusion that a fair and reasonable sum to charge the Works department for interest on capital (in place of rent) would be 1,234*l.* 5*s.* 6d., and for repayment of 1-55th of the capital, 748*l.* 0*s.* 11d., making together 1,982*l.* 6*s.* 5d. As to the interest to be charged on what may be regarded as the working capital, the Council is aware that the advances made to the Works Department for purchasing plant and materials have been made out of the general funds of the Council, so that from time to time the cash balance has been reduced to that extent, and a certain loss of interest has been incurred by the depletion of the account. We think the case will be met by charging as interest the average deposit rate of interest, which for the current year has been exceptionally low, and, calculated on the estimated value of the stock of materials and plant in hand at the end of each quarter, the charge would amount to 425*l.* The amount charged for 1893-4 (243*l.* 15*s.*) was arrived at in a similar manner. The Council on June 19, 1894, directed that 'in order to cover the extra cost to be incurred by the Works Department in supplying details of estimated cost of jobbing works under the agreed schedule of prices, a contribution be made to the Works Department out of the general establishment expenses, such amount to be agreed upon at the end of the current financial year in connexion with other financial adjustments with the Works Department, which will then have to be made.' Information has been furnished as to the persons employed in connexion with measuring works and the preparation of the schedule of prices, and the sum of 300*l.* has been fixed as a proper amount to allow the Works Department on this account. We have had a conference with the members of the Works Committee, who were deputed to arrange the matter, and have discussed the subject fully with them, and they concur in the following recommendations, which we submit for adoption, viz.:—

'(*a*) That a charge of 660*l.* be made to the Works Department in respect of salaries and expenses at the central offices for the year ending March 31, 1895. (*b*) That a sum of 300*l.* be allowed to the Works Department in respect of the same period for extra cost incurred in supplying details of estimated cost of jobbing works, in pursuance of the Council's resolution of June 19, 1894. (*c*) That the amount to be charged (in lieu of rent) to the Works Department for interest on and repayment of original capital outlay on the central wharf and buildings for the same period be 1,982*l.* 6*s.* 5d. (*d*) That the amount of interest to be charged to the Works Department on the advances made for purchase of stock and plant during the present financial year be 425*l.*'"

Recommendations *a*, *b*, and *c*, having been adopted,

Sir John Lubbock, M.P., moved on *d* to substitute the words: "At the rate of 3 per cent." for "425." In his opinion the "call" rate should not be adopted, because the money was not obtainable at call.

The amendment having been seconded,

Alderman Ritchie, in supporting it, said that the Works Department should be upon the same basis as the contractors, and that, as the latter could not borrow money for the purpose at the call-rate, the Works Department should not be permitted to do so.

Mr. Hoare (Chairman of the Committee) said the contractor would not charge in his profit and loss account for the repayment of capital, whereas the Works Department had to do so; and one thing had to be set against another.

Sir J. Blundell Maple contended that the contractors' accounts provided for depreciation and the payment of interest on capital.

Mr. Goodman said contractors, when they were engaged on any undertaking, drew 88 per cent. every month of the value of the work done, whereas the Works Department only received from time to time the amount of the wages that had to be paid.

On a show of hands there voted 48 for the amendment, and 51 against it. The Council divided with the following result:—For the amendment, 56; against it, 63.

Recommendation (*d*) was then adopted.

The Parks Committee, later in the meeting, brought up the following report:—

"On November 13, 1894, we reported to the Council that the cost of certain works undertaken by the Works Department had exceeded the estimates, and the Council then sanctioned the additional cost which had been incurred. The Comptroller has since reported to us that the final ascertained cost slightly exceeds the additional expenditure sanctioned by the Council, as shown in the following table:—

Name of place.	Work.	Estimate accepted by Works Department.	Corrected estimate after measurement of completed work.	Amount already sanctioned by Council.	Further amount required.
		£	£ s. d.	£ s. d.	£ s. d.
Southwark Park	Cricketers' shelter	460	474 2 9	632 4 3	4 6 7
Victoria Park	Refreshment house	1,000	1,029 5 0	1,517 15 9	2 7 0
Clapham Common	Conveniences	700	707 17 0	1,054 12 0	4 11 2
Bethnal Green Gardens (Poor's Land Section)...	Boundary railings	2,200	2,170 16 10	2,275 12 1	0 10 6

We recommend—

'That the Committee be authorised to incur a further expenditure of 11*l.* 15*s.* 3d., in respect of the cost over and above the accepted estimates of works carried out by the Works Committee as above enumerated.'"

Alderman Ritchie asked for an explanation of the increase.

Mr. Ward (Chairman of the Works Committee) said that when the department made a profit nothing was said upon the subject, and the Council did not even know at the time of the circumstance, because it was only when additional money had to be voted that the matter had to be reported upon by a Committee. Of the total number of works executed which had been reported upon, it was shown that the estimate amounted to 66,000*l.*, whereas the actual cost had only been 63,000*l.*

Sir J. Lubbock asked how it was that there had been no report as to the completed work since October.

Mr. Ward said there was great difficulty in making out the final accounts. Besides, the Council had passed a standing order directing the Committee to report twice a-year—in April and October; and further particulars would, therefore, be forthcoming in a few weeks.

The report was adopted.

Government Buildings.—Mr. Burns, M.P., asked the acting Chairman of the Building Act Committee if he would consider the advisability of approaching Her Majesty's Office of Works in order to see whether in the building of post-offices and other Government buildings, it would adapt itself to the general lines of frontage determined on by the local authority?

Mr. Roberts said the Government always fought hard to get itself exempted from the Building Acts. He wished the Council had control over such buildings as Mr. Burns referred to.

The Council, having transacted other business, adjourned soon after seven o'clock.

COMPETITIONS.

SCHOOLS, SWANAGE.—The first premium in the competition for new schools at Swanage has been awarded to Mr. W. F. Taylor, of Aylesbury, and the second to Messrs. Houston & Houston, 13, Furnival's Inn, London.

NEW SCHOOLS, NORTH SHIELDS.—We understand that in the recent competition for new schools, Coach-lane, North Shields, the plans of Messrs. Marshall & Dick have been placed first in order by the assessor, Mr. E. R. Robson. The schools have been planned to accommodate 1,350 children; accommodation has also been arranged for pupil teachers' central teaching rooms, and for special subjects, including chemistry, cooking, art, &c. The estimated cost is about 15,000*l.*

NEW HOTEL, NEWCASTLE.—The directors of the Belfast and County Down Railway Company, assisted by Mr. Alfred Waterhouse, R.A., assessor, have awarded the premiums in connexion with the competitive designs for the new hotel at Newcastle. The first premium, of 100*l.*, was awarded to Mr. James J. Farrall, M.R.I.A.I., of Westmoreland-street, Dublin; the second, of 75*l.*, to Messrs. Gibson & Russell, Associates, R.I.B.A., of 11, Gray's Inn-square, London; the third, of 50*l.*, to Mr. F. H. Tulloch, A.R.I.B.A., 39, Victoria-street, Westminster, and Mr. Lionel Littlewood, F.S.I., of 49, Doughty-street, Bedford-row.

ARCHÆOLOGICAL SOCIETIES.

SURREY ARCHÆOLOGICAL SOCIETY.—The fortieth annual meeting of this Society was held at 8, Danes Inn, Strand, on the 27th ult., when the President, Viscount Midleton, occupied the chair, and moved the adoption of the report of the Council and statement of accounts. The report stated that the committee appointed at the last annual meeting to visit Guildford in search of suitable accommodation for the head-quarters of the Society, duly met and visited that town, but failed to find any place at all suitable. A report was made to the Council, and it was determined that no action could be taken at present, bearing in mind that suitable premises might at some future date be available. The report went on to state that the annual excursion was held on Wednesday, July 18, 1894, the meeting-place being Farnham, whence Bentley, Froyle, and Cromlall were visited. The Council took this opportunity of returning the thanks of the Society to all who assisted in rendering the meeting successful (see *Builder*, July 28, 1894). The part of the Society's "Collections" (vol. xii., part i.) for the year 1894 was issued to all members not in arrear with their subscriptions. In this part is a valuable paper on "Compton Church," by Mr. J. L. André, F.S.A., and one on "The Manor of Lambeth," by Mr. S. W. Kershaw, F.S.A. The catalogue of church plate is still being continued, as are also the extracts from Surrey wills. The "Visitation of Surrey" is drawing to a close, and the editors hope to finish it in the next part. The finances of the Society need strengthening by the addition of more annual subscribers. A substantial addition to the number of such subscribers would enable the Council to enlarge and better illustrate the publications of the Society. The London and Middlesex Archæological Society, for many years the joint-tenant of the room in Danes Inn, has recently determined its tenancy and moved away. Unless a new co-tenant can be found, this will still further burden the Society's finances. The library still further continues to increase by exchanges from kindred societies, but from lack of

funds it is impossible to keep up the binding of the various "Transactions" received. The following members of Council retire by rotation, but are eligible for re-election, viz.:—The Hon. G. C. Brodrick, D.C.L.; G. E. Cokayne, F.S.A.; F. A. Crisp; Colonel Davis, F.S.A.; J. F. Eastwood; E. Freshfield, LL.D.; W. More Molyneux; and Ralph Nevill, F.S.A. The number of members is 313. During the year 14 new members have been elected. By death the Society has lost 4 members, and by resignation 7 members; total, 11: gain over loss, 3 members. Although not strictly within the limit of this report, the Council desires to refer to two events which have occurred in the early part of the year 1895. The first is to record the loss the Society has sustained in the death of Mr. J. W. Butterworth, a Vice-President, and one of the founders of the Society. Mr. Butterworth died on January 8 last, and the Council, on behalf of the Society, took the first opportunity of passing a resolution conveying to his representatives the condolences of the Society. The second event to which the Council desires to refer is the issue of the "Calendar of the Feet of Fines for the County of Surrey, from Richard I. to Henry VII." For those working on the early history of the county this Calendar will prove of the greatest service, for there is no Calendar to this class of document in the Public Record Office. To the Calendar is appended a complete index, both of names and places, this alone represents a long and tedious amount of work. The Council desires to convey to Mr. F. B. Lewis, the editor, the best thanks of the Society for not only kindly placing the MS. at the disposal of the Society, but also for preparing the index and seeing the work through the press. The original estimate for publishing this Calendar has been slightly exceeded by reason of the work having been issued in cloth instead of in paper covers as usual. To cover this and sundry small items for delivery and postage, the Council proposes to ask permission to borrow, on the same terms as before, a further sum of 20*l.* from the reserve fund, in order to discharge this liability. Mr. J. F. Eastwood, in seconding the motion for the adoption of the report, said the Surrey County Council was about to build a science and art building at Kingston, very close to the county hall, and the building was to have a county museum, and it was now a question whether it might not be possible to ask the County Council to receive and show their collections for them. It would save them many expenses, and might in every way be desirable. He thought that the proposed building at Kingston would make a capital home for the Society, and it was quite time they had one. The report and balance-sheet were unanimously adopted, and the retiring members of the Council were re-elected. Mr. Mill Stephenson, F.S.A., and the Rev. T. S. Cooper, M.A., were re-elected Honorary Secretaries, and Mr. W. F. Potter and Mr. C. T. Davis, auditors, and Mr. W. P. Ivatts was re-elected Collector to the Society. The meeting was then made special, pursuant to notice, when Mr. Ralph Nevill moved the following resolution: "That the Council be empowered to borrow a further sum of 20*l.* from the reserve fund, in order to discharge certain liabilities in connexion with the publication of the 'Feet of Fines'; the same to be repaid by annual instalments of not less than 10*l.* per annum." This was carried unanimously, and votes of thanks to the President and officers closed the proceedings.

ARCHITECTURAL SOCIETIES.

EDINBURGH ARCHITECTURAL ASSOCIATION EXCURSION.—An excursion of the Edinburgh Architectural Association was taken on the 30th ult. by over thirty members. Starting from Charlotte-square, they drove first to Dalmeny House, through which they were conducted by Mr. Hippolyte J. Blanc, A.R.S.A. Proceeding next to Barnbougle Castle, Mr. Blanc gave a sketch of the once powerful family of the Mowbrays. Continuing the journey to South Queensferry, Mr. Thomas Ross, F.S.A.Scot., conducted the party over the Carmelite Priory Church, and described its outstanding points. Erected by the family of Dundas, of Dundas, probably about the latter half of the fifteenth century, the building was in ruins till some six years ago, when the Dean and Chapter of St. Mary's Cathedral, Edinburgh, had it fitted up as a place of worship. In the course of the outing the historic church of Dalmeny was also inspected. Mr. Blanc pointed out the features of interest in plan, and especially in the numerous details of the church, noting its harmony in these respects with contemporaneous work in France and England. Comparison was also made with analogous features in Leuchars, St. Margaret's Chapel, Duddingston, &c. Mr. Blanc and Mr. Ross were cordially thanked for their services.

GLASGOW ARCHITECTURAL ASSOCIATION.—The general monthly meeting of this Association was held in the rooms, 114, West Campbell-street, on the 2nd inst., Mr. A. N. Paterson, President, in the chair, when the Secretary, Mr. Walter R. Watson, read a paper on "Sir Christopher Wren." The essayist, in his opening remarks, gave a historical and descriptive account of England in the middle of the seventeenth century, and explained the state of general science and the architectural practice of the period. The chief events of Wren's interesting and eventful career were then alluded to, notably the visit to Paris, and it was shown under what advantageous circumstances that visit was made. Referring to the circumstance that Wren, unknown even as an architectural amateur, was selected to assist the Surveyor-General, the lecturer remarked that he was at that time, more than any other man in the kingdom, equal to anything of national importance that might be required. His love for architecture was only a part of his sympathy for everything that could appeal to a man of genius; had there been no mathematician of eminence besides himself, nor any remarkable poet, painter, or sculptor, Wren would have been all or any of these, as the necessity of the time might have required. The second part of the paper was devoted to a description of a few of the great architect's better-known works, and was illustrated by diagrams, photographs, &c. In concluding, Mr. Watson said the genius of Wren was doubtless greatly influenced by the moral goodness of his character; he might be regarded as a perfect example of the Vitruvian model, worthy, in every sense, of his self-erected mausoleum and of the noble epitaph which confirmed its dedication.

Correspondence.

To the Editor of THE BUILDER.

CARDIFF, SOUTH WALES, AND MONMOUTHSHIRE ARCHITECTS' SOCIETY.

SIR,—Your editorial note of March 9, commenting adversely on the action of this Society in sending a memorial to the Corporation asking them to invite a public competition for designs for the new Museum and Art Gallery proposed to be built in Park-place, Cardiff, was reprinted in the *Western Mail*, with one-third of it omitted, and this the most important part of your article. The part I mean reads as follows:—"A delay of two years occurred, after which it was proposed to remove the Museum and Art Gallery to another site, a scheme which Mr. Seward approved of, but the library alone was proceeded with, and is now approaching completion from his designs, and it was understood that he would be commissioned to carry out the Museum and Art Gallery whenever a fitting site was obtained. This has now been done, and Mr. Seward, at the request of the Corporation, had reported on the site and sketched some alternative plans."

I wrote to the *Western Mail* pointing this out, and asking why this most important information should have been given to the editor of the *Builder* and withheld from our Society and from the Cardiff papers, but to this communication I have received no reply, and no notice has been taken of my request. I presume Mr. Seward must have supplied you with this information, for it has appeared in no Cardiff paper.

If Mr. Seward was promised by the Corporation two years ago that when a suitable site was obtained for the new Museum and Art Gallery, and if the Museum Committee had requested him to prepare sketch-plans for the new site, then to all intents and purposes he was its architect, and the Society of which I am President had no right even to ask the Committee to arrange its competition on the lines suggested by the Royal Institute of British Architects. And at least five of the members of the Museum Committee have grievously misled myself and the members of the Society. I have been told personally by one of the oldest and most respected members of the Corporation that it has not given Mr. Seward this promise, and that the sketch-plans which he has prepared were prepared entirely without the authority of the Committee, and prepared by Mr. Seward as a private member of the Museum Committee without its sanction or request. Moreover, there is no minute of the Corporation setting forth this promise, and no minute of the proceedings of the Museum Committee requesting Mr. Seward to prepare these sketch-plans.

We also had at our meeting of January 25 last, when we passed the following resolution—["That unless they (the Museum Committee) have already pledged themselves to any architect they should invite a public competition for designs for the new Museum Buildings in Park-place, the competition to be under the rules of the Royal Institute of British Architects"] a letter from the Vice-Chairman of the Museum Committee, which reads as follows:—

"38, Charles-street, January 24, 1895.

DEAR CORBETT.—The Museum Building Committee was only appointed last week, and so far has not even been called together, much less appointed an architect. They cannot, therefore, be pledged to anyone. My own opinion is that plans will be advertised for in the usual way.—Yours very truly,

(Signed) C. T. VACHELL."

Dr. Vachell is one if not the most active members of the Museum Committee, and for many years past has taken the greatest interest in the Museum. I believe he is scarcely ever absent from the meetings of the Committee, and at least ought to have known whether they consider themselves pledged to an architect. In an interview I had with him before our meeting, he even spoke in more emphatic language, and told me that it was the intention of the Museum Committee to advertise for plans. Again, at the meeting we had the same information given to us by Mr. Corbett—the first Chairman of our Society, and one who took a very prominent part in its organisation—that several members of the Museum Committee had seen him respecting the land in his capacity as agent to Lord Bute, and had given him to understand that the Committee intended to advertise for plans for the building.

We also had a letter before us from Mr. Seward, in which he said that the work was in his hands, and that he had a legal claim to it. This being so, we were bound to respect Mr. Seward's claim and the words of Dr. Vachell and Mr. Corbett, our first Chairman, and by passing the resolution before quoted (our only sin) we did both, for we had the strongest possible reasons for knowing that a competition would be advertised, and we wished it and thought it our duty as a Society to make the modest request that the competition should be on the lines suggested by the Royal Institute of British Architects, and I feel certain that you, Sir, and the profession generally will agree with me that in offering such a suggestion to the Committee we were doing one of our simplest duties.

But what really are Mr. Seward's claims? His firm, then Messrs. James, Seward, & Thomas, in the year 1880, won the competition for designs for the Free Library, Museum, and Art Gallery, and and the firm carried out this building. In 1890 they were commissioned to extend this building, although even at that time there was a desire on the part of the committee to advertise the extension in competition; but the principal members of our Society at that time petitioned the committee to employ his firm, for right professional reasons, without hesitation. The extension was to cost 12,000*l.*, but the contract, without extras, and the building is fast approaching completion, has cost 18,000*l.*, although the extension of the Museum and Art Gallery, as first contemplated, was abandoned in their design.

The Corporation have now acquired another and a separate site for the Museum and Art Gallery, a site quite, as I said in my former letter, half a mile away from the present building and the only work so far, that Mr. Seward has done for the new and separate scheme is to prepare sketch plans on his own authority and to assist the committee in his honorary capacity as a member of that Committee.

I have had no desire from the first to discuss Mr. Seward's claims in public or elsewhere, but he by his action has forced me to do so. The letter which he wrote to me and intended me to read at our annual dinner in February last, containing as it did in its second sentence an accusation against the Society of a grave and serious nature and bristling with the very strongest terms,—such as harassing and injuring his "professional practice," "cruelly inequitable," and the like—would have been quite out of place in such a gathering composed as it was of a number of guests quite unconnected with the profession, and I felt fully justified in not reading it or alluding to it. And this incident he claims, by his letter appearing in your issue of the 30th ult., to have roused public interest in his claims, and how this could have been the case when no eye but my own had seen that letter, passes my understanding. It is true that letter appeared in print in both our local papers, and Mr. Seward alone was responsible for this publicity, and this forced me into print, and to undertake a most unwilling, objectionable, and disagreeable task of more or less discussing, in quite the wrong place, his claim to act as the architect for the new Museum and Art Gallery. I have received one letter only, from a local architect, suggesting that the conduct of our Society in this matter should be submitted to the President of the Institute, and I have not replied to his letter, as I received it just after submitting the whole of the correspondence to you, Sir, and I shall be glad now that you have the whole of the facts before you, if you will give expression to your opinion of the matter, or I am sure the Society would give its sanction, if you think it necessary, to my placing the whole of the correspondence before the President of the Institute. I am the more ready to adopt this course, for I am certain that no single member in Cardiff, South Wales, and Monmouthshire Architects' Society, has any desire or wish to

deprive Mr. Seward of any just claims, but, on the contrary, when the proper time comes, if he has either a moral or legal claim to act as architect for the building, we will uphold him in it by every means in our power.

E. M. BRUCE VAUGHAN.

Cardiff, April 3, 1895.

*** The information Mr. Vaughan refers to in the first part of his letter was received by us from Mr. Seward in the first instance, but we declined (according to our usual practice) to make any comment on *ex parte* information in a private letter until the matter became the subject of public notoriety in the local newspapers, when the letters and interviews published appeared in the main to confirm his statements, except that (as Mr. Seward himself pointed out to us) we should have said "at the request of the committee," not the "Corporation." The committee, however, were acting for the Corporation. We do not believe (nor, we understand, does Mr. Seward) that Mr. Vaughan personally has or had any desire to act unfairly to Mr. Seward; but we think that the action of the Cardiff Society of Architects in sending in the memorial in question just after Mr. Seward had ceased to be their President (an event for which they seem to have waited) was manifestly a "move" against him, and will appear so to most outsiders, and that under the circumstances it was in very bad taste. We cannot go further into the matter; Mr. Seward can reply to this letter if he wishes, and the correspondence must then close.—ED.

THE TECHNICAL EDUCATION CONFERENCE.

SIR,—It is to be hoped that the above Conference, and the discussion in your columns as well, will not be permitted to degenerate into a mere debate on trade unionism and the apprentice system, for, much as I believe in trade unions, and trade unionists, I am not a believer in much of their methods; in any case there is no need at present to make these matters the question at a Technical Education Conference.

I am surprised to find proposals to revive the apprentice system and the furtherance of technical education discussed side by side, especially so as the two questions have nothing in common, one being a product of Mediævalism, the other of the nineteenth century. The introduction of the factory system and the development of modern industrialism, proved to be the death of the one and the birth of the other, and because the one died—died in consequence of having survived the conditions that had called it forth—precisely for that reason and from that date technical education became possible, simply because it began to supply a want; it is destined to do for the future what the apprentice system did for the past.

The cry for technical education is loudest to-day where the old apprentice system has disappeared. Wherever it still struggles on, there also the want of technical education is not so keenly felt, as can easily be noticed in our small country towns and villages, where the workman-master may be found with his three or four men and an apprentice, the latter generally under the personal supervision of his master, who has undertaken to teach him a trade, and not a part of one. Under existing conditions in industrial centres it is almost impossible to do this; the sub-division of labour is carried on to such an extent that it is difficult to say what a trade is, the old lines of demarcation have been so often altered in this respect to meet the exigencies of "business."

During the halcyon days of the apprentice system a carpenter was a worker in wood, who made with his own hands all that a man wanted in that material from a cradle at his birth to his coffin at his death; a mason was a worker in stone, he quarried and dressed it for whatever purpose it was intended, whether it was destined as part of a building to house the carpenter's cradle or a tombstone to indicate where the coffin was buried. The same with the blacksmith; he attended to man's many wants in iron. Then there was a trade to learn, and we have proof that they were thoroughly learnt, too. Take any of the above examples, you will find that each of them has been subdivided and simplified over and over again until at last a smart, strong youth is able, after a few months' probation with a small man, to fight for himself; he then aspires to "get a start in a large firm," his energy may recommend him to his foreman, who would put him on with a good mate; and thus the double process of "learning his trade" and earning his living goes along to the mutual advantage of all.

From a national point of view this is far from being satisfactory; individuals here and there do learn a trade, but there is far too much of the element of chance about it for us to rely on bringing up a generation to learn its trades in the same haphazard way. Since the factory superseded the workshop, and "Captains of Industry" the master-workman, individual contact and individual control ceased, the teaching of the apprentice was relegated to others, the very essence of the old system was at once lost, and from that moment it was doomed to a lingering death. The above changes have created new wants, and the question of the hour is, How are we going to supply them?

Your correspondent, Mr. Wright, states that the "Trade unions have failed to get their members to join the classes at Great Titchfield Street." There are very many reasons for this, some of them exist apart from trade unionism. One very important point is, that young fellows should be got to join such classes so soon as the School Board has done with them, and before the brain has lost its receptivity; the true education of the citizen will never be what it should be until this is done; the London School Board is responsible for some of the above apathy. Let me give an instance to illustrate what I mean; a man and boy were sent to do some work on a job I was on last summer. I asked the man is that your son? He said, "O yes, and he is a good scholard, as good as there is"; the boy had passed the seventh standard; the father, by a process of reasoning acceptable to himself, had come to the conclusion that because the School Board did not teach the boy any more, nobody else could—that there was no more to be taught. This is a very common error; people must be made to realise that passing the seventh standard is not the omega of all knowledge; unfortunately, this is too prevalent an idea to-day; it engenders a false conception of sufficiency in educational matters; it hinders the progress of technical education, and is to some degree responsible for the sparseness of attendance at such classes.

If these young fellows could be prevailed upon to continue their studies directly they leave day schools, by attending technical classes in the evening, the void which the gradual decay of the apprentice system left would, to a large extent, be made good; even then much remains to be done, and I am not at all sure that technical education, as at present understood, is likely to accomplish it.

JOHN DAVIES.

SALARIES OF RURAL DISTRICT SURVEYORS.

SIR,—That some reform is urgently needed in the salaries paid to Local Surveyors, I quite distinctly see, but where the money is to come from is a matter which Mr. Baylis does not go into.

As the largest ratepayer of a rural district, I can assure that gentleman that myself and other property-owners are often at a loss to make up necessary amounts, and which we very frequently do out of our own pockets.

A fortnight ago I drove over with my agent and inspected a few alterations and improvements actually necessary, and I think if Mr. Baylis had been with me at a subsequent Council meeting, he would certainly alter his opinion as to authorities not understanding the value of a good man. That they do I am satisfied, but in rural districts, where resources are extremely limited, any attempt to raise rates already high is sure to provoke opposition.

JOHN CECIL WILLIAMS.

Daisy Villa, Heath and Reach, Beds.

The Student's Column.

BRICKS AND TERRA-COTTA.

XIII. AND XIV.

DURABILITY OF BRICKS (*continued*).

THE careless burning of bricks affects their durability in many other ways than those mentioned in the last article. Even where no attempt is made to glaze, or to partially glaze, their surfaces, it frequently happens that the exterior of the bricks becomes thoroughly burned long before the interior has practically felt the heat. Of course, this is in a great measure due to the employment of inferior earths in the first place. We may exclude from consideration, however, those bricks made of such material that no amount of careful burning could improve their quality; and, taking an average brick-earth, it may be said that a better-class brick, of fair durability, could be produced if heat were more gradually applied than is in most instances done at present. We have previously alluded to the common practice, especially in the London district, of mixing fine coal, coke, or breeze with the earths to assist in burning them. It does not seem to be generally known, but this reprehensible proceeding might be done away with, better bricks produced, and at much less cost in some parts of the district (unless we are vastly mistaken) by making the brick-earth lighter and more open in the first place. In the neighbourhood of Erith the other day, it was interesting to note the care with which the earths were prepared as contrasted with the method that will be adopted, as was explained to us, when they are burned. It would seem that here, as at many other places, the earths are manufactured with reference to a particular manner of burning; or rather that they are specially prepared with reference to results produced in burning on their being mixed with breeze. At one pit the brick-earth is dug, taken in little trucks and tipped into the clay-mill, where it is cut and stirred by knives and harrows put in motion by steam machinery. When the whole mass of earth is reduced to the consistency of cream it passes through a grating, and is pumped through a pipe some distance, to settling-pits. Not far off is a chalk quarry, with machinery on the spot for grinding the chalk to a pulp, and this also is pumped to the place where the settling-pits are, where it is mixed with the brick-earth before alluded to. Now, the object of mixing the chalk with the other earth is twofold. First, it acts mechanically in lessening the contraction of the raw brick before burning; and, secondly, it acts chemically as a flux during the burning process. It is believed also that the addition of chalk improves the colour of bricks when burned. We will not gainsay any of these things. But it struck us that the contraction might just as well have been diminished by the judicious admixture of some of the fine quartzose sand from the formation immediately above the chalk in that district, of which there is a great abundance. The brick-earth itself contains a certain proportion of lime, it effervesces briskly with a drop of hydrochloric acid. It may not possess sufficient lime to form a good flux, however, unless burned very hard, so that a little additional chalk might be an improvement from that point of view. Clearly, the elements are here present that should do away with the desirability of mixing breeze. With properly-constructed kilns and careful burning, bricks far above the average of those produced in the London area could be made from the splendid earths at Erith. We have no hesitation in saying that very few manufacturers in the North or Midlands would be content with producing an ordinary brick with such good materials at hand. We do not wish to convey that Erith bricks are of inferior durability; on the contrary, they already compare very favourably with some of the best made in the vicinity of the Metropolis; what we feel is that something still better might be made from the earths mentioned.

Leaving that district for the present, and turning to general considerations, it may be remarked that, theoretically, the whole of the carbonate of lime mixed with the earths becomes chemically combined during burning; but that by no means always takes place in practice, and failure in that respect seriously affects the durability of the materials. Failure generally proceeds from insufficient burning. Such lime as is not combined becomes slaked when wetted, and the substance of the brick gradually crumbles away.

The composition of some earths is such that, on burning, the particles never become properly agglutinated; the bricks are thus very porous and of a sandy nature. The cohesion of the particles one to another is of the slightest, consisting for the most part of that produced solely by pressure on angular surfaces during manufacture. Carbonic and other deleterious acids found in the atmosphere readily have access to the interior of such bricks, with disastrous results. These bricks are usually remarkable for uniformity in colour, and, strange to relate, they fetch good prices in the market. So far as durability is concerned, a London stock brick of the worst description is usually far superior to it.

The question of efflorescence is an important one, but as it affects terra-cotta as much as bricks we propose to deal with it when speaking of the durability of terra-cotta.

Many bricks "vegetate," though not, usually, to the same extent as stone. It has always remained a moot point with stone as to whether this property is to be regarded as favourable, or the reverse, to its durability, but we do not think there can be much doubt as to its meaning with bricks. Stones frequently undergo a certain amount of chemical change after being built up, the net result of which is to produce a hard skin on their surfaces; bricks are not so susceptible of this alteration when well burnt, being then almost entirely composed of silicates, which are not easily affected by percolating moisture. Lichens, mosses, and the like, readily take root in the earthy coatings of stone, and on their decay provide organic acids capable of doing an immense amount of harm, so that unless the stone is of exceptional quality it is apt to be destroyed by this agency. Bricks, unless of the sandy, incoherent nature just now alluded to, contain no such coating, and do not afford convenient foothold for any plants, except, perhaps, certain species of minute fungi. It may be taken for granted that bricks that materially "vegetate" are not of good quality, though we have no objection to the ubiquitous minute fungi mentioned.

It is difficult to consider the "vegetation" of bricks apart from that of the mortar in which they are set. This latter, as everyone knows, often

yields an abundant flora in favourable situations. If bricks were much affected by the action of organic acids derived from wall vegetation, they would speedily decay from growths in the mortar rather than from any plants they themselves could sustain. The principal harm done by vegetation in mortar is where the plants are large and their roots penetrating bricks by way of small cracks widen these latter by pressure during growth. The brick would have to be of poor quality, however, that would be much affected by this. Walls which come to grief by the growth of vegetation on them have usually suffered by the cohesion of the mortar having been destroyed.

The question has often been raised as to whether the durability of bricks is in any way impaired by permitting the growth of ivy upon them; the answer to this is, emphatically, no, so far as the bricks are concerned, unless they are of very bad quality indeed. We will not say, however, that the stability of a wall may not be affected thereby; that is a different matter. A thick mantle of ivy tends to protect bricks from inclement weather, and in many cases keeps their surfaces quite dry, so that they are shielded from weathering influences. At the same time, thick rootlets occasionally split bricks, and warp or twist the wall. Ivy should not be permitted to grow on walls that are not substantially built, as it is apt to undermine their foundations.

In regard to the durability of bricks for specific purposes, we have partially described the qualifications of good fire-bricks in another connexion. Quite a large number of these is used for ordinary building, though we have often suspected whether they have not been "specially" manufactured for this purpose. When used as linings for furnaces they are not only subjected to great divergence in temperature, but are brought in juxtaposition with the contents of the furnace, which enter into alliance with them unless they are proof against the union. Repeated alternate expansion and contraction naturally destroys their nature in time, and leads to the formation of cracks; but the durability of a fire-brick, as such, is more particularly governed by its refractory behaviour in the presence of a flux, and each case must rest on its own merits. When simply used for lining flues, refractoriness as against heat alone is its best qualification. Its temper is sorely tried on being used in glass furnaces, where, however, the raw fire-clay by itself is often only employed.

Bricks for use in chemical works should be practically proof against powerful corrosive acids. A great number of different kinds theoretically answer this description, if one is to judge from the results recorded on selected examples as given in commercial circulars; but the action bricks are frequently subjected to in most chemical factories is infinitely more powerful than is capable of being produced in the laboratories of the average analytical chemist, and we doubt whether anything short of practical tests in the factory is able to indicate the durability of bricks under such trying circumstances. The more pure silica they contain the better for most purposes, but occasionally it is well to carry out the chemical manufactures in presence of bricks chemically prepared, though this is not often done, except in a rough way.

The durability of paving bricks is as much bound up in the production of a non-slippery as of a durable material. The most durable paving brick that could be devised would no doubt be of a very slippery nature, but it might also be very brittle and not capable of withstanding heavy weights. A paving brick, in addition to these qualifications, ought to be almost non-porous and not easily disintegrated by friction. It is questionable whether bricks of any kind that have been burned, as distinct from concrete blocks, are really suitable for street paving. In stables, in courtyards, and the like, they find a proper place, but it is purgatory to walk for any length of time on footpaths laid with the average paving brick. It is seriously believed in some quarters that sufficient foothold is produced by diagonally channelling the bricks. The durability of paving bricks, *per se*, depends on their capability of withstanding heavy weights suddenly applied, and as suddenly taken away, the general effect being of the nature of a blow. They must therefore be very tough. We have never seen tough paving bricks that did not become slippery on being subjected to street traffic. But, if they possess that disadvantage, they are as a rule not very porous, and are distinctly good from a sanitary point of view. The powerful organic acids found in the stable and in the refuse of streets, which will affect almost any kind of road-metal or paving, save, perhaps, the best asphalte, do not decompose the average paving brick.

This seems a fitting opportunity to sum up the qualities that should be ascertained in good building bricks. There is but little to fear on account of their behaviour from a chemical point of view in the atmosphere, as bricks, unless obviously very inferior, are not materially affected by the solvent power of rain-water with its accompanying acids in solution. They should not present more cracks and small fissures than can possibly be helped, and bricks in which the cracks radiate from certain points should be rejected, as the expansion of ice within, during frosty weather, tends to split them in all directions. In order to test whether a brick is well burned, break it in halves and note the appearance presented by the fractured parts, which should be practically the same tint from the centre to the outside. A sound brick can often be judged from its characteristic metallic ring, but that is not an infallible test in glazed bricks having an extremely hard metallic-looking surface and soft interiors. It is always easier to ascertain the quality of a brick by breaking it in pieces and regarding the fragments than by any other "rough and ready" process. By that means not only can thoroughness of burning be determined, but some idea of its strength is derived. A durable brick should not contain white patches when burnt, nor should any little stones or gross particles be present. A great deal may be learned, by rubbing two bricks together, as to how far the particles composing them have become agglutinated in burning; but, in judging of the quality of bricks by this method, care should be taken to remove any sandy material that may adhere to the surface, and which may have been used in the moulding, and subsequently, to prevent the clay from adhering to its supports during drying and burning. Perhaps the most severe test to which a brick may be subjected, is to make it red hot, and then to drop it into a bucket of cold water; if it survives this ordeal there is not much the matter with it.

NUISANCES IN BRICK-BURNING.

THE police magistrate and higher functionaries of the judicial bench are frequently required to settle disputes and to enforce the law with reference to public nuisances arising from the manufacture of bricks. We do not intend to discuss the matter in its legal aspects, but it may be useful to say a few words as to the general sources of origin of the nuisances. In nearly every case brought into court it is proved that the operation of burning the raw materials is responsible for the offensive odours given off, though there can be no doubt that the composition of the earths as made up artificially, prior to moulding, is also answerable therefor. Occasionally, sulphurous smells may arise from the employment of inferior fuel, containing sulphide of iron, but this cause would be comparatively insignificant in its effects, and would rarely lead to the condemnation of the manufacture as a public nuisance. Dense volumes of smoke issuing from open kilns or due to clamp burning, during the first few hours after the fires have been lighted, have sometimes been cited as prime factors in the nuisance, but legislation in recent years has led considerably to abatement on this head in the neighbourhood of towns, where the complaints have chiefly been made. Nevertheless, there is much room for improvement in that direction, as, indeed, in smoke-abatement generally.

The trouble caused by smoke alone, however, pales into insignificance before that due to the composition of the earths burnt. These latter in their worst forms may be divided into two groups: (1) Natural clays, containing much iron pyrites and carbonaceous matter, and (2) Town refuse held together by a cement of clay. These two categories trespass on each other, some of the latter material, in greater or less degree, being mixed with the former. Of the first group, it is possible to abate the nuisance caused by abstracting the iron pyrites. That mineral is of high specific gravity, and usually occurs in solid lumps, so that by a simple process of levigation it can be readily removed from the clay where any trouble at all is taken in the preparation of the raw earths. A brick manufacturer can have no excuse to offer for allowing a nuisance due to this cause to exist. It is amusing to note the defence usually set up in such cases, which is that the brick-earth employed is of the "ordinary kind," and that the maker cannot be held responsible for the composition of natural clays.

Where the clay is artificially mixed with chalk, evolution of carbonic acid takes place on burning, owing to the more or less complete calcination of the carbonate of lime. This nuisance could be removed by the addition of lime only, instead of carbonate of lime, which would also improve the character of the bricks. If natural marl is used, the only way is to arrange for the consumption of the smoke, &c., arising from the kiln—not always an easy matter.

The greatest nuisances from brick-burning come from the employment of the second group of earths mentioned—those made almost exclusively of town refuse and impure earths. The only way to prevent these annoyances is to compulsorily close the works. It is often difficult to arrive at their true nature, however. Evidence in such cases is that a certain amount of "breeze" is added to the raw brick-earths to more effectually burn them, then it is stated by witnesses that "breeze" is employed for a similar purpose in practically all brickyards in the neighbourhood of London, further that the nuisance complained of does not exist, "therefore" the prosecution, or the pursuer for an injunction, must fail. The prosecution, on the other hand, although bringing forth witnesses to prove the existence of odours, in most instances neglects to show whether they are injurious to health or not, and there is generally an absence of expert opinion as to the composition of the moulded bricks before they are burnt. What is wanted in such cases is definite information concerning the character of the breeze; all other matters are secondary to this. Breeze may consist of cinders, coke, or small coal, when any nuisance arising could not be due to the mixture of the material with the clay; it is different, however, when the breeze is compounded of bones, rags, cork, decaying vegetable matter, &c.

The brick-burning nuisance, so loudly complained of in the outskirts of London, could be almost entirely removed, other considerations apart, by the compulsory adoption of one or other of the patent brick kilns which consumes its own smoke and delivers the gases and vapours produced into the atmosphere at the height of, say, about 150 ft. from the surface of the ground. So long as open-kiln firing is permissible, and no control is exercised over the character of the breeze employed, the nuisance is bound to exist. The product of refuse-destructors, if it does not become too valuable for the purpose, might be used in greater quantity than it is at present in the manufacture of bricks. When we learn that certain vestries are making, or are about to make, paving-stones of that refuse, and of a quality that "eclipses all other kinds of pavement," we shall not be surprised if London brickmakers find it increasingly difficult to obtain that class of breeze in the future.

Bacteria in Bricks.

Micro-organisms are credited with doing and undoing so many things now-a-days that it is not remarkable that bricks, terra-cotta, and earthenware generally, should have been found recently to contain large colonies, which are stated to lead to the ultimate decay of the materials. We have read some evidence on this matter, and whilst there seems to be no doubt of the capability of bacteria to live and thrive in bricks, we are not convinced that they are important factors in promoting decay in that connexion. Still, it may be interesting to give a few particulars as laid down by the *Wiener Allgemeine Bauzeitung* in 1884, just after the discovery had been made by M. Parize. After alluding to the causes usually attributed to the decay of bricks, such as the development of crumbly and powdery earth on their surfaces, due to deleterious influences of the weather, M. Parize states that these latter are wholly insufficient to account for all the facts of the case. Whilst examining a brick party-wall which was slightly damp, he observed some blister-like patches on several parts of the thin plaster, by which the brickwork was covered. On piercing one of these, very fine red dust escaped, which, on a microscopic examination, was found to contain amorphous mineral matter and other substances, but also an immense number of extremely active organisms. Thinking, possibly, that the occurrence was merely of a superficial character, he carefully removed the thin layer, together with the decomposed surface of the brick, and piercing the brick to the centre, where it was of usual hardness and well burnt, obtained a sample of powder made during the operation, from that point. Here the same kinds of organisms as were proved at the surface, presented themselves, though not in the same quantity, there being only 100 living organisms per square centimètre of the preparation instead of 150. All bricks taken from the wall in question displayed the same appearances, both internally and externally. From the description it would appear

that the experiments were carried out with due care, though the results are rather loosely given.

We should like to have the results of examinations of a similar kind on other bricks, however, than those obtained from a damp wall. The power of penetration possessed by micro-organisms in these cases must of necessity run *pari passu* with the relative porosity of the bricks concerned; given a non-porous brick, it is inconceivable that any damage can be done to it by bacteria. Even where the porosity of the brick is such as to permit the ready penetration and growth of this plant life it is difficult to see what change could be wrought thereby that could be charged with promoting the decay of the substance of the material. Is it contended that the organisms subsist on the highly metamorphosed mineral matter? We do not think for a moment that such contention could be sustained. Or, is it reasonable to suppose that the decay of the bacteria themselves creates destructive organic acids? We think not. That such acids may be made in such manner goes without saying—M. Julien, of New York, proved that years ago; but, active as these acids undoubtedly are, they are unable to produce any appreciative effect even when manufactured by Nature in large quantities, on the durability of the average brick; we have seen that already, in connexion with the growth of wall vegetation in mortar, &c. How much less, then, would they be capable of doing injury to the brick when made only in such minute quantities as could arise from the decay of bacteria in in the interior of bricks?

Indirectly, however, the researches of M. Parize possess considerable interest in connexion with hospital buildings. Every one knows of the propagation of disease through the medium of walls in hospitals, and of the precautions taken to prevent the same. And nobody doubts, since the pathogenic nature of many micro-organisms has been well-established, that non-porous walls are best under the circumstances. But few, perhaps, were willing to concede that bacteria were to be found in the interior of bricks to the extent proved by the Continental experimenter alluded to. Medical authorities have already given us a great deal of information as to the special facilities afforded to the penetration in hospital walls of disease germs. Except in very few instances the remedies have hitherto been confined, however, to the application of some substance, or chemical compound, to the internal walls of the building. Clearly, bricks, unless strictly non-porous, should not be used in hospital construction at all. Neither is building-stone of any kind except, perhaps, the harder varieties of granite, suitable, from a medical point of view.

This opens up a question, full of interest, as to whether sewers should be constructed of brick, or porous earthenware of any description. We are not of those who are scared by the thought of bacteria being omnipresent, but precautions should at any rate be taken to prevent the effectual growth of these organisms in situations which might reasonably be supposed to be specially favourable to their appearance in pathogenic form in large quantities; and in no place could they be imagined to exist or to thrive more successfully than in the public sewer. The last statement is open to the argument that pathogenic forms frequently succumb to the superior growth and influence of harmless bacteria in sewers; but that obviously depends on the length of the sewer, the relative rapidity of the fall of the fœcal matter, and the distance between the point of ingress of the harmful microphytes in question and the sewer outfall. In any case, it cannot be held distinctly good from a sanitary point of view to construct sewers of brick, &c., after what has just been said, especially where the material is as porous as is the average brick of commerce. In our experiments on the relative porosity of several kinds of bricks, many of the results given will prove serviceable in this direction.

Smoke-stained Bricks.

In the days when bricks from old buildings were put to higher uses than they are at present, complaints were frequently made that smoke-stained bricks—stained through having originally formed part of the internal construction of a chimney—built into the drawing-room wall, stained the plastering and wall-paper also. If the plastering were pulled down and more put up in its place, the same thing happened, and so on, indefinitely. We very rarely hear of difficulties on that head now, but the question is frequently with us in modified form, especially with reference to country buildings. The point is, what inexpensive process may be adopted to prevent the internal plaster and wall-paper from becoming so disfigured from the cause mentioned. Many cheap remedies have been suggested, and the following appear to be successful. The bricks affected may have their outward surfaces chiselled off for about a quarter of an inch, even though they be stained right through. A thick rough coat of well-haired cinder ash mortar is next laid on and allowed to become thoroughly dry, when a second but finer coat of the same materials is applied. Then a third and extremely fine and thin coat is affixed before the second is quite dry, and the surface thus formed is whitewashed. Another method is to attach slate, thin sheet-lead, or tin-foil to the bricks, laying on the plaster over them. The same results can, of course, be arrived at by more expensive processes.

OBITUARY.

Mr. James Wilkins.—Mr. James Wilkins, who has just died at his residence, Hurle-crescent, Clifton, at the age of 60, was the elder son of the late Mr. Robert Wilkins, the founder of the firm of R. Wilkins & Sons, builders, with whom, in conjunction with his brother, Mr. George Wilkins, the deceased for many years carrried on business. Mr. James Wilkins severed his connexion with the firm about ten or twelve years ago, before the death of his father, and carried on business on his own account in Ashley-road, and he retired only a few months ago. Amongst the local works in the erection of which he took part were the Children's Hospital, the Bristol Grammar School, the removal of St. Werburgh's Church from the city and its re-erection on its present site near Mina-road; St. Nathaniel's Church, and the additions to Christ Church, Clifton. The original firm founded by his father gave rise to no less than five firms of builders in the city.

Mr. F. Thrupp.—At Thurlow, his residence in Thurlow Park, Torquay, Mr. Frederick Thrupp, sculptor, died on the 21st ult., aged 82 years. He was born at Paddington Green, and for the greater part of his life lived and worked in the Metropolis. For very many years Mr. Thrupp exhibited regularly at the Academy. Wordsworth's monument in Westminster Abbey, and that to Sir Fowell Buxton, also in the Abbey, are the work of Mr. Thrupp; while two or three of his figures are in the Mansion House. The monument to Lady Coleridge, in Ottery St. Mary Church, was executed by him, and among other of his public works are the reredos in St. Clement's, York, representing the Last Supper, and the monument of Canon Pearson in Sonning Church, near Reading.

GENERAL BUILDING NEWS.

New Dining Hall, &c., Jam Works, Aintree.—Large dining halls are being erected for the accommodation of the men and women employed in these works. During the season as many as 3,000 meals per day have to be provided. The women's dining hall is 82 ft. by 48 ft., and is so arranged that it can be easily converted into an assembly hall. The men's dining-room is 27 ft. by 18 ft. The kitchen is 42 ft. by 27 ft. The kitchen is lined inside with glazed bricks, and the dining halls will have a faïence dado, 6 ft. high, from the works of Messrs. Craven, Dunnill & Co. The exterior is faced with Blackburn pressed bricks, with Yorkshire stone dressings, and the roofs will be covered with Edwards' red tiles. Messrs. Moore, Bros., of Lawtenstall, are the principal contractors, and the ventilation and heating works are being carried out on the mechanical system by Mr. William Key, of Glasgow. The architect is Mr. Fred. W. Dixon, of Manchester and Oldham.

Baptist School-Chapel, Horfield, Gloucestershire.—The memorial-stones of the new Baptist school-chapel at Horfield were laid on the 27th ult. The school will be completed forthwith, and will accommodate 500 scholars and 800 worshippers. The walls are to be of Pennant stone with Bath facings, and the fittings of the interior will be of pitch-pine. The schoolroom is to be divided into class-rooms by means of folding partitions of pitch-pine. The roof will be of open timber to about half the pitch, and the windows will be of cathedral tinted-glass in ornamental design, and the floors of wood-blocks on concrete. The architect is Mr. H. J. Jones, and the work, which is estimated at 2,074*l.*, will be done by Messrs. R. Wilkins & Sons, builders.

Schoolrooms, Exeter.—The new schoolrooms in connexion with Providence Chapel, Exeter, were opened on the 1st inst. The new halls and schools, which are constructed externally of white facing bricks with Bath-stone dressings, comprise a lecture hall, with open timber roof, measuring 40 ft. by 30 ft., three alcoves, two 20 ft. by 12 ft., and one 18 ft. by 6 ft., with movable platform, and the whole place will accommodate about 450 people. Around the hall several class-rooms are arranged. There are four entrances, two being from Northenhay-street, and two from Maddock's-row. The architect was Mr. W. S. Croote, and the builder, Mr. G. Herbert.

School Buildings, Morley.—The new premises of the Morley Friends' Adult School, situate in Ackroyd-street, were opened on the 30th ult., by Mr. John Whiting, of Leeds. The principal entrance is in Ackroyd-street, and stone staircases adjoining the entrances at each end of the building provide access to the large hall or assembly-room on the upper floor, which is 50 ft. long and 30 ft. wide, and is provided with a raised platform at the farther end, with an arched recess. A serving-room, with a lift communicating with the kitchen for school teas, and a committee-room, are situated in close proximity to the platform end of the hall. The accommodation on the ground floor comprises a library and reading-room, 28 ft. in length; a meeting-room for mothers' and sewing-meetings, 26 ft. long by 14 ft. 6 in. wide; and four class-rooms, with fixed seating of Oregon pine. The kitchen for school teas is also provided on this floor. The building is faced with stone and roofed with Bangor slates. It has been carried out from the designs and under the superintendence of Mr. William H. Thorp, of Leeds.

Choir Stalls, Otley Parish Church.—Recently a choir-screen was erected in All Saints' Church, Otley, to the memory of the late Mrs. Fison, of Greenholme, and still more recently, Mr. P. Garnett, of Moorville, Burley, Woodhead, has presented to the church a set of choir stalls, which has just been dedicated by the Archdeacon of Ripon. The new stalls, which are designed to be in keeping with the new chancel-screen, provide accommodation for twenty-seven men, and twenty-four boys. The principal features of the stalls are the traceried and carved open-work fronts, and the massive ends, finished with carved poppy heads and sunk tracery work. The carving is the work of Mr. W. Clayton, of London. The stalls themselves are the work of Mr. Taylor, of Yeadon, who also made the adjoining screen.

FOREIGN AND COLONIAL.

France.—M. Henri Roujon, Directeur des Beaux-Arts, is to visit London shortly for a few weeks to study the organisation of English museums.——The Comte de Susor, Architect-in-Chief to the city of St. Petersburg, has been appointed a corresponding member of the Académie des Beaux-Arts, in the section of Architecture.——The Senate has authorised the erection of a bust of Henri Mürger in the garden of the Luxembourg, in the vicinity of the Odéon.——The Parliamentary Committee charged with the reorganisation of the Service des Bâtiments Civils has decided on attaching that service to the Department of Fine Arts.——The Municipal Council of Paris has authorised the formation of a siphon under the Seine, at the Pont de la Concorde, and the construction of a large collecting sewer at Clichy, in the exterior section of the fortifications. This work, which will cost nearly three million francs, is to be entrusted to M. Berlier, the engineer who carried out the siphon at Asnières.——The Nord Railway Company proposes to establish a new railway station in the neighbourhood of the Faubourg St. Denis, which will serve as a terminal station for suburban trains.——A bust of the sculptor Pierre Puget is to be inaugurated at Toulon.——It is announced that a monument is to be erected at Vaucluse to "Laure de Noves," better known as Petrarch's Laura.——The Narbonne Fine Art Society is opening its second exhibition on May 19th.——The monument to Théodore de Banville at Moulins is to be inaugurated in August next.

MISCELLANEOUS.

Good Friday Week.—Next week we go to press a day earlier than usual. All communications for the Editor should reach him by *first post on Wednesday morning*, except lists of tenders, which will be received up to 10 a.m. of the same day.

Municipal Buildings, Aberdeen.—The erection of the new police offices on the site of the old prison in Lodge-walk, Aberdeen, which will be completed by October next, will allow of the removal thither of the City Police Court-room and of the central accommodation for the City Constabulary. The space in the Municipal Buildings thus vacated will then be available for the Burgh Surveyor's, Public Health, City Tax Office, and Gas Office Departments, which require additional accommodation. The Town Council has resolved that the heads of the different departments should be invited to prepare a statement of the accommodation required by them. Competitive designs for carrying out the alterations are, after this has been adjusted, to be invited from architects practising in Aberdeen, and submitted to a neutral architect, to be afterwards named as arbitrator to decide as to which of the designs best meets the requirements of the case. The author of the design placed first in the order of merit by the arbitrator will be employed as architect for the alterations, upon the usual terms of professional remuneration, and the authors of the designs placed second and third to receive a premium of 30*l.* and 20*l.* respectively. An enlarge-

ment of the Town Hall may be included in the alterations.

ENGINEERING STUDENTS AT PORTSMOUTH DOCKYARD.—About ninety students from the Crystal Palace Company School of Practical Engineering visited the Portsmouth Dockyard on the 29th ult. The students were divided into two parties, the first under the care of the Principal, Mr. J. W. Wilson. This party visited the wood-block-making shop, where the celebrated machinery of the elder Brunel was seen at work. The smitheries were next visited; here the forging of a big davit was witnessed. Another place of interest was the pump-house and the air-compressing chambers. The pump, which lifts eight tons of water at every stroke, was set to work. The gun shop was also visited, after which the principal's party went on board the *Duchess of Albany*, where the students, in parties of three, inspected the engines at work, and obtained data for a paper which will have to be written on the subject. The steamer was then tested over the measured mile, and necessary notes were taken. In the meantime the second party was doing civil engineering work under the conduct of Mr. J. W. Wilson, junr., Vice-Principal. Major Raban, R.E., Superintendent Engineer of the Dockyard, accompanied this party, who visited the dock extension, as well as the new battleship *Prince George*, now being constructed. The Commander of H.M.S. *Revenge* showed the younger Mr. Wilson's party all over his vessel, and explained everything of interest to his visitors.

ORGAN FRONT, CHURCH OF ST. MARYCHURCH, NEAR TORQUAY.—There has just been added to the parish church of St. Marychurch, near Torquay, an ornamental front to the organ and its pipes, which occupy the north side of the chancel. The case is of carved and traceried English oak, designed by Mr. George H. Fellowes-Prynne, architect, and made in the studios of Messrs. Harry Hems & Sons.

"NEWSPAPER MAPS" OF AUSTRALIA AND SOUTH AFRICA.—We have received from Messrs. C. Mitchell & Co. two large-scale maps of Australasia and South Africa, giving marginal lists of the existing newspapers in those countries, the "newspaper towns" being marked by large asterisks on the maps, which also give railways and steamboat routes. These maps should be very useful to those who have commercial relations with the Australian and South African colonies.

BATH SEWAGE DISPOSAL.—The City Council of Bath have engaged Mr. W. H. Radford, C.E., of Nottingham, to complete his plans of intercepting sewers and sewage disposal works for the city, and to furnish estimates of cost, he having previously been engaged to report on a preliminary scheme and prepare preliminary plans. The population is about 50,000, and the scheme will be a large one with the latest modern improvements.

STRIKE IN THE LEICESTER BUILDING TRADE.—Meetings of both the master builders and the Leicester carpenters and joiners who have come out on strike were held on the 1st inst. At the meeting of the employers it was decided to engage skilled operatives, unionists or non-unionists, at 8½d. per hour—the advanced wage—on one condition, and that was that they should accept the rules which had existed since 1891, until a new code could be settled between the Masters' Association and the Operatives' Society. But as the operatives insisted on the adoption of their new rules *en bloc*, they remained out, and the deadlock continues.

ADMIXTURES IN PORTLAND CEMENT MANUFACTURE.—In a paper read by Mr. D. B. Butler at the Society of Engineers on Monday last, he said, referring to the recent controversy as to adding new materials to the clinker of Portland cement:—"The one material about which the controversy chiefly rages is Kentish rag, a limestone of varying composition found near Maidstone. From samples of cement containing a certain addition of this limestone, which have been sent to the author for testing in the ordinary course, the results by the usual methods of mechanical testing compare favourably with average English cements, even when gauged with three parts of standard sand, though of course what results they would give without the admixture, he has had no opportunity of judging. He has, however, instituted a considerable series of experiments on the subject, extending over a lengthy period, and when these are completed, he will be able to speak more definitely on the matter. The same question of admixtures arose in Germany a few years back, where adulteration was then largely practised, and the results of experiments, carried out under the auspices of the German Cement Makers' Association, seemed to prove that admixtures of any sort detrimentally affected the cement, and, as a consequence, a resolution was passed, by which the members of that Association bound themselves not to use any admixture whatever, an exception being made in the case of gypsum, of which two per cent. was allowed to regulate the time of set. On the other hand, Professor Tetmajer of Zurich obtained very different results from those of the German Association. With certain admixtures he obtained equally good and in some cases better results than with the pure cement. Until, therefore, we have more conclusive independent evidence in their favour, it seems questionable whether admixtures of any sort are desirable. As, however, such admixtures, and more especially Kentish Rag, are easily detected by analysis, the user, at all events, has it in his power to discriminate between the ordinary calcined product and that containing an admixture."

LEGAL.

PRINSEP *v.* BELGRAVIA ESTATE, LIMITED.

THIS was an action by the plaintiff, Lady Prinsep, to restrain the defendants, who were builders, from carrying on their building operations on a plot of land adjoining the plaintiff's dwelling-house in such a manner as to cause loss and damage to the plaintiff under the following circumstances. In the course of their building operations the defendants had, in the month of November last, excavated the plot of land to a considerable, but not to an unusual, depth, in such a manner that the floor of the excavation sloped towards the wall of the plaintiff's house. About that time very heavy falls of rain occurred, with the result that that part of the excavation adjoining the plaintiff's premises was flooded and the water percolated into the basement of the said premises and flooded it to the depth of two or three inches.

The plaintiff alleged that the flooding of her premises was entirely due to the negligence of the defendants in so excavating their plot of land as to make the floor of the excavation slope towards her house, and she sought an injunction to restrain them from continuing to carry on their work in that manner.

The defendants denied negligence on their part, and said that the slope of the floor aforesaid towards the plaintiff's property was the necessary consequence of a cartway they had constructed in order to enable carts to go down into and come out of the excavation. They further alleged that the said cartway was necessary for the proper and effective performance of their building operations. As a matter of fact, the injunction was never granted, the wet weather having passed away, and with it all damage or inconvenience to the plaintiff occasioned thereby.

The case was argued before Mr. Justice Stirling on March 20 and 21, with a view to deciding the question as to costs, and his Lordship delivered a reserved judgment on March 30. After stating the facts, his Lordship continued:—I am now asked to dispose of the costs of this action, and in order to do so it is necessary for me to go into the merits of the case. The first question to be considered is what is the principle of law applicable to the case? The plaintiff relied on the case of Broder *v.* Saillard (reported in "Law Reports," 2 Ch. Div. 692), which decided that the occupier of a house is liable for allowing the continuance on his premises of any "artificial" work which causes a nuisance to a neighbour, and she alleged that the defendants had erected an "artificial" erection (*i.e.*, the cartway), and had made an "artificial" excavation on their plot of land.

Now, in my opinion, these operations were not "artificial," but were operations conducted with a view to the natural enjoyment of the land, and nothing more. The land is building land in London, and the operations of the defendants were simply for the purpose of erecting a house thereon, and it does not seem to me that this can be said to constitute an "artificial" state of the land within the meaning of Rylands *v.* Fletcher (reported in "Law Reports," 3 H.L. 330).

His Lordship also referred to Wilson *v.* Waddell, "Law Reports," 2 App. Case, 95, and West Cumberland Iron and Steel Company *v.* Kenyon. "Law Reports," 11 Ch. Div., 782, and continued:—

The landowner will not, of course, escape from liability unless his operations are carried on with care and without negligence, and as I have decided that the defendant's operations were not "artificial" within the meaning of the cases I have already cited, the matter now depends solely on the question of negligence. The affidavits on this point, however, are very contradictory, and I cannot, on the materials before me, come to any definite conclusion. Consequently, the only order I can make is that there should be no costs.

OBSTRUCTION OF LIGHT:

IMPORTANT CASE IN THE CHANCERY DIVISION.

THE case of the Kensington Co-Operative Stores, Limited, *v.* J. Lyons & Co., Limited, which came before Mr. Justice Romer in the Chancery Division the week before last, was concluded on Thursday, the 28th ult., it being an action brought by the plaintiffs for an injunction to restrain the defendants from interfering with the access of light to their windows.

Mr. Neville, Q.C., and Mr. Wagget appeared as counsel for the plaintiffs; and Mr. Levett, Q.C., Mr. de Witt, and Mr. Martelli for the defendants.

From the facts, which were exceedingly complicated, it appeared that the premises in question were situated at West Kensington, and formerly constituted portions of Cadby Hall, occupied by and belonging to Messrs. Woodhouse & Rawson. The two blocks of buildings were exactly similar in height and construction, having a large number of windows on the sides where they faced each other, across an intervening space of about 33 ft. in width, and the plaintiffs' property included a portion of that space to a distance of 10 ft. or 11 ft. from their wall, the remaining and larger portion of the space belonging to the defendants, there being an iron railing separating the two properties. In September last the defendants erected certain buildings on their portion of the intervening space, and the plaintiffs immediately commenced the present action, on the ground that such buildings interfered with the access of light to some of their windows, which injured their property and seriously interfered with the conduct and success of their business in certain branches. The plaintiffs' title to maintain the action depended on what is legally known as the doctrine of implied grants. It appeared that prior to August, 1892, both blocks of buildings, with the intervening space, belonged to Woodhouse & Rawson, but subject to a legal mortgage. On August 8, 1892, the plaintiffs' block, with their portion of the courtyard, was conveyed to a former company, of whom the plaintiffs are now the successors discharged from the mortgage, the mortgagees joining in the conveyance to convey the legal estate, and receiving the purchase-money in part discharge of their mortgage money. On the same day a mortgage in fee simple was granted of the property last conveyed, and by another deed in which the before-mentioned conveyance was recited the remainder of the mortgage debt and the premises which now constitute the defendant's property were transferred and conveyed to a Mr. Hibbert. The company who were the purchasers in 1892 went into voluntary liquidation in 1893 for the purposes of reconstruction, and all their property was transferred and conveyed to the present plaintiffs, who by agreement with the mortgagees of August 8, 1892, substituted a new mortgage in fee for that affecting their property when they purchased. The defendants purchased their block and portion of the courtyard from Mr. Hibbert, who, in 1894, exercised his power of sale as mortgagee. The defendants, in addition to denying the alleged obstruction of light, disputed the plaintiffs' right to rely upon the grant made in August, 1892. They further alleged that, having regard to some discussion as to building on the courtyard which took place on the granting of a lease of the plaintiffs' premises in 1890, there was evidence to rebut the presumption of grant, if any existed.

At the conclusion of the evidence and the arguments of counsel, his Lordship, in giving judgment said that if ever there was a case of grant by implication this was such a case. That being so, the question was, had the defendant's new building substantially interfered with the enjoyment of that light by the plaintiffs? On the evidence he felt no doubt that the new buildings did substantially interfere with the plaintiff's windows in the basement and ground floor, and in his opinion the injury sustained by the plaintiffs was a very serious one, and great damage would be done to a very important building if the Court disregarded what had been done, or allowed the interference with the light to be continued. The interference being so substantial, the defendants were not entitled to keep their new building standing on simply paying a money compensation to the plaintiffs, and the plaintiffs were entitled to have the defendants' buildings restricted to substantially the state in which they formerly existed. The defendants were not bound to pull down the whole of the new buildings, but the buildings would not be allowed to stand in such a condition as to obstruct the plaintiffs' light. The plaintiffs were entitled to an injunction to restrain the defendants from permitting to remain or erecting any wall or building on the north side of the plaintiffs' building, so as to interfere with the access of light to the plaintiffs' windows in the north and north-east walls on their basement and ground-floor, as such light existed in August, 1892. His Lordship also directed that there should be an inquiry as to the damages the plaintiffs had sustained in the meantime, and ordered the defendants to pay the costs of the action. The costs of the inquiry he reserved.

CLAIM FOR AN INJUNCTION:

TO RESTRAIN THE PULLING DOWN OF A HOUSE.

THE case of Horton *v.* the Aston Local Board came before Mr. Baron Pollock in the Queen's Bench Division on Tuesday.

Mr. Jelf, Q.C., and Mr. Arthur Young appeared as counsel for the plaintiff; and Mr. Lawrance and Mr. Vachell for the defendants.

Mr. Jelf said the case came before the Birmingham Assizes last year, but as two of the main points were not sufficiently developed in the pleadings, with his Lordship's permission it was adjourned at the plaintiff's expense to allow the pleadings to be amended. The action was for an injunction to restrain the defendants from pulling down a house in a certain road at Aston, which they had passed a resolution to pull down. The plaintiff's case was that the defendants were not in a position to do this, because they were bound by contract made for good consideration to give consent to the building of the house in the way in which it was built over a certain

sewer. Secondly, even supposing that the defendants had the legal right on a proper hearing, and after proper warning, to pull down the house, they had acquired it in an improper manner. The curious thing was that the house was built over the sewer in exactly the same way as other houses which were not objected to. It seemed to him (the learned counsel) a pity that the money of the plaintiff and the ratepayers should be expended in the litigation, and he hoped his Lordship might be able to suggest some reasonable manner of dealing with the dispute. Mr. Jelf then proceeded to explain the circumstances under which the house came to be built. He said that the plaintiff was a house-agent, and the house in question was one of a number erected on a piece of land called Hall Moor Meadow. The question was whether the house was built over that part of the sewer over which, it was contended, permission was given to build.

His Lordship, having thrown out a suggestion that the case should be terminated without needless expense, Mr. Jelf said that the plaintiff was willing to do anything that was considered reasonably necessary if the house were allowed to stand.

A consultation then took place between the counsel engaged, and after a short interval Mr. Jelf announced that a settlement had been arrived at. The parties had agreed to withdraw the record on the terms which had been endorsed on counsel's briefs.

MEETINGS.

FRIDAY, APRIL 5.

Institution of Junior Engineers.—Mr. Walter G. McMillan on "The Study of Alloys." 8 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Professor W. H. Corfield, M.A., on "Sanitary Appliances." 8 p.m.

Institution of Civil Engineers (Students' Meeting).—Mr. Henry Home on "The New South Pier, Sunderland." 8 p.m.

SATURDAY, APRIL 6.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Visit and Inspection of East Surrey Waterworks, &c., Kenley.

Queen's College, Cork.—Mr. Arthur Hill on "The History of Architecture." XVIII. 3 p.m.

MONDAY, APRIL 8.

Architectural Association Camera Club.—Exhibition of Members' Photographs and Lantern Slides. 8 p.m.

Liverpool Architectural Society.—Mr. E. R. Taylor on "Architecture a Craft." 6.30 p.m.

TUESDAY, APRIL 9.

Builders' Clerks' Benevolent Institution.—Annual Dinner, King's Hall, Holborn Restaurant. 6.30 p.m.

Institution of Civil Engineers.—Further discussion on Messrs. J. I. Thornycroft, F.R.S., and Syd. W. Barnaby's paper on "Torpedo-Boat Destroyers." 8 p.m.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Mr. J. Wright Clarke on "Details of Plumbers' Work." 8 p.m.

Glasgow Architectural Association.—Visit at 5.30 p.m.

WEDNESDAY, APRIL 10.

Crystal Palace School of Practical Engineering.—Award of Certificates. 12 noon.

Sanitary Institute (Lectures and Demonstrations for Sanitary Officers).—Inspection and Demonstration in the Parish of St. George's, Hanover-square. 2 p.m.

THURSDAY, APRIL 11.

Civil and Mechanical Engineers' Society.—Mr. H. Coward on "Laundry Machinery." 7 p.m.

SATURDAY, APRIL 13.

Edinburgh Architectural Association.—Visit to (1) Heriot Hospital Technical School; (2) the Royal Hospital for Sick Children.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

5,810.—SCAFFOLDING: *J. Flower and another.*—A device for fixing together the poles for scaffolding. Consists of a chain having at one end a single bar-link, and at the other a small perforated drum. The drum is allowed to rotate on studs, formed by its central bosses, taking a bearing against a plate which is shaped to bear against one of the scaffold-poles. The chain is passed round the poles and tightened by turning the drum with a suitable lever.

5,996.—SINK: *J. Rowland.*—Relates to a sink having a well, and provided with a rebate. The rebate has an outer case, and is fitted with an inner perforated container, so constructed as to form a secure stench-trap, and prevent any solid matter passing into the drain. The container may be lifted out and cleaned when required.

8,003.—GLAZING ROOFS: *W. Heywood and another.*—For this purpose an inverted T-iron is employed, upon which a soft metallic covering is fixed, channels being provided upon the upper side of each lower wing of the inverted T-iron, for carrying asbestos packing, on which the glass rests. The soft metallic covering folding round the base of the inverted T-iron secures the whole in position.

11,894.—HINGE HOOKS: *S. Burgess.*—Relates to hooks and catches for doors, and consists of bent hooks and catches having caulked ends for building into brickwork, &c.

704.—GLAZING BARS: *E. Podmore and another.*—Refers chiefly to lead caps for holding sheets of glass upon the ridges of metal glazing bars. These caps are secured by a T-headed bolt, which fits into a recess in the ridge of the glazing bar, and is made secure by a rivetted metal clip. Other clips held by nuts are placed at suitable distances apart to keep the leaden cap in position.

1,539.—HINGES: *J. Frei.*—A pin-and-socket hinge for doors, which can be easily lubricated. It has two pins, which meet in the socket, one of which is provided with an internal channel whereby a lubricant may be introduced between the working surfaces.

NEW APPLICATIONS FOR LETTERS PATENT.

MARCH 18.—5,619, J. Corp, Sliding Windows.—5,622, E. Harris, Window Sashes.—5,627. R. Price, Tool Sharpening Rest.—5,634, W. Whiteley, Junior, Fastenings for Doors, Windows, &c.

MARCH 19.—5,724, H. Weyhe, Blocks or Slabs for Building Purposes.—5,737, A. Lübbe and W. Keating, Locks for Sliding Doors.—5,774, J. Corp, Window Frames.—5,787, W. Christian and A. Wilson, Window-Sash Fasteners.

MARCH 20.—5,813, H. Bladen and others, Girders.—5,817, T. Whitehead, Extracting Ventilators or Chimney Tops.—5,820, W. Simmons, Sashes.—5,837, B. Hodgson, Window Fastener.—5,848, F. Griffin, Movable Gas Brackets.—5,871, R. Hitchins, Protector for Stairs.

MARCH 21.—5,882. W. Harpur, Joints to Sewer Pipe.—5,931, H. Curtis, Water Supply Pipes, &c.—5,933, T. Roberts, Portable Terra-Cotta Stoves.

MARCH 22.—5,981, S. Naylor, Hot Water Apparatus for Houses.—5,987. C. Clifton, Planing Machines.

MARCH 23.—6,032, W. Dodwell, Stop Taps for the Prevention of Pipes Bursting.—6,082, J. Murray, Window Sashes and Frames.—6,083, J. Campbell, Manufacture of Certain Colours or Pigments,—6,086, J. Fittall, Air-tight dust-bin.

PROVISIONAL SPECIFICATIONS ACCEPTED.

1,854, G. Blackburn, Electric Burglar Alarm for Doors.—2,239, J. Parker, Bell Handles and Bell Pushes.—2,769, J. and A. Carr, Decorations for Shop Fronts, Shop Fittings, &c.—3,314, L. Symonds, Fire Grates.—3,723, W. Mann and J. Pullan, Machinery for Pressing Tiles, Bricks, &c.—4,101, H. Jeuss, Glazing Windows, &c.—4,373, J. Adey, Hinges.—4,438, J. Köhler, Tiles.—4,503, J. Barton, Windows.—4,647, L. Cresswell, Domestic and other Fire-places. 5,163, E. Verity and B. Banks, Floor Cramps.

COMPLETE SPECIFICATIONS ACCEPTED.

(Open to Opposition for Two Months.)

8,204, H. Barham, Smoke Preventing Chimney-pot and Draught Inducer.—9,545, A Bauchère, Continuous or Running Kilns for Burning Lime, Cement, &c.; 9,702, P. Knobel, Angle or Square.—1,445, T. Harris, Combined Gully Trap, Air Inlet, and Inspection Shaft.—3,842, H. & W. Bougartz, Zinc Roofing.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

MARCH 22.—By *Field & Son:* 203, 205, and 207, Coldharbour-lane, Camberwell, u.t. 46 yrs., g.r. 20*l.* 16s., r. 185*l.* 10s., 2,625*l.*; 2 to 14 even, Lewis-rd., u.t. 46 yrs., g.r. 28*l.*, 1,260*l.*; i.g.r. of 12*l.* 12s., Lilford-rd., u.t. 16 yrs., g.r. 6*l.* 6s., 60*l.*; 23, Denmark-rd., u.t. 8 yrs., g.r. 3*l.*, r. 23*l.*, 115*l.*; 36, Abbeville-rd., Clapham, u.t. 85 yrs., g.r. 7*l.*, r. 34*l.*, 330*l.*; 60 and 62, Coldharbour-lane, Camberwell, f., r. 81*l.*, 1,650*l.*; 68 and 70, Coldharbour-lane, f., r. 84*l.*, 1,840*l.*; 1, Denmark-rd., f., r. 20*l.*, 325*l.*; 20, Denmark-rd., f., r. 28*l.*, 460*l.*; 22, Denmark-r., f., r. 28*l.*, 470*l.*; 50, 52 and 54, Carter-st., Walworth, f., r. 102*l.*, 1,790*l.*; 56, 58 and 60, Carter-st., f., r. 110*l.*, 1,860*l.*—By *Herring, Son & Daw:* f.g.r. of 105*l.*, Macklin-st., High Holborn, reversion in 82 yrs., 2,340*l.*; a freehold rental of 120*l.*, Wood-lane, Highgate, 1,800*l.*

MARCH 25.—By *G. A. Wilkinson & Son:* 3, Conduit-st., Regent-st., Corporation lease 40 yrs., g.r. 4*l.*, fine 28*l.*, r. 150*l.*, 5,600*l.*; 4, Conduit-st., Corporation lease 40 yrs., g.r. 4*l.* 7s. 6d., fine 30*l.* 12s. 6d., r. 210*l.*, 6,700*l.*; 59, Fleet-st., City of London, and 2, Pleydell-st., f., area 1,218 ft., 9,900*l.*—By *Harman Bros.:* "Kent Lodge," Green Lanes, Hornsey, u.t. 33 yrs., g.r. 3*l.* 10s., r. 38*l.*, 315*l.*; 2, Malvern-rd., u.t. 82 yrs., g.r. 6*l.*, 205*l.*; 80, Andover-rd., Holloway, 1, 2, and 3, Franchise-ct., u.t. 48 yrs., g.r., 12*l.*, r. 49*l.* 8s., 150*l.*—By *F. Perks:* 24, Devonshire-pl., Portland-pl., u.t. 24 yrs., g.r. 100*l.*, r. 210*l.*, 1,275*l.*

MARCH 26.—By *Bean, Burnett, & Eldridge:* "The Grange," Elstree, Herts, with stabling and about 5 a., f. enclosure of land, 3 a. 3 r. 30 p., f., 750*l.*; 173, 175, and 177, West Green-rd., Tottenham, u.t. 87 yrs., g.r. 15*l.*, 600*l.*; 181, West Green-rd., u.t. 87 yrs., g.r. 5*l.*, 210*l.*—By *E. & S. Smith:* 65, Oldfield-rd., Stoke Newington, u.t. 67 yrs., g.r. 5*l.*, 245*l.*; 102, Hawkesley-rd., u.t. 79 yrs., g.r. 5*l.* 10s., r. 24*l.*, 215*l.*; 151, High-rd., Stamford Hill, u.t. 72 yrs., g.r. 8*l.* 8s., r. 28*l.*, 160*l.*; 154, Downham-rd., De Beauvoir Town, u.t. 57 yrs., g.r. 6*l.* 6s., r. 40*l.*, 405*l.*—By *W. Houghton:* 15, Cedars-av., Walthamstow, f., r. 30*l.*, 430*l.*

MARCH 27.—By *H. L. Howell:* 2, 3, and 4, Goldhurst-ter. East, Hampstead, u.t. 84 yrs., g.r. 24*l.*, r. 150*l.*, 1,480*l.*—By *Boyce & Evens:* 37, Fournier-st., Spitalfields, f., 700*l.*; 5, Steward-st., f., area 1,220 ft., 600*l.*—By *Hunter & Hunter:* 9, 11, 13, 15, and 17, Victoria-rd., Sutton, u.t. 70 yrs., g.r. 25*l.*, 400*l.*; i.g.r. of 125*l.*, Liverpool-rd., Islington, u.t. 11¾ yrs., g.r. 50*l.*, 550*l.*—By *Daniel Smith, Son, & Oakley:* 11a and 12a, Pelham-st., Brompton, u.t. 18 yrs., g.r. 3*l.*, r. 130*l.*, 1,280*l.*—By *E. & S. Smith:* 85, Lenthall-rd., Dalston, u.t. 65 yrs., g.r. 8*l.* 8s., r. 34*l.*, 355*l.*; 17a, 19a, 21a, and 23a, Maclaren-st., Clapton, f., r. 78*l.*, 650*l.*; 46, Hunter-st., Brunswick-sq., u.t. 11 yrs., g.r. 26*l.* 5s., 86*l.*; 40, Penn-st., Hoxton, u.t. 41 yrs., g.r. 5*l.* 10s., r. 33*l.*, 310*l.*; 37, Popham-rd., Islington, u.t. 13 yrs., g.r. 5*l.*, r. 27*l.*, 90*l.*—By *R. Tidey & Son:* 14, 15, and 16, York Buildings, King's Cross, u.t. 31¾ yrs., g.r. 12*l.*, 27*l.*; 37 and 39, Shepperton-rd., Hoxton, u.t. 11¾ yrs., g.r. 12*l.*, r. 80*l.*, 245*l.*; 37, Mortimer-rd., De Beauvoir Town, u.t. 21 yrs., g.r. 1*l.*, 255*l.*; 11 and 12, Laurel-st., Dalston u.t. 28 yrs., g.r. 12*l.*, r. 52*l.*, 325*l.*; 16 and 17, Laurel-st., u.t. 28 yrs., g.r. 12*l.*, r. 50*l.*, 330*l.*; 18, Laurel-st., sold privately.—By *Segrave, Browett, & Taylor:* The residence called "Woodland Grange," Swanley, Kent, f., 800*l.*—By *Mullett, Booker, & Co.:* 20, Victoria Grove, Brompton, f., r. 60*l.*, 650*l.*

MARCH 28.—By *Stimson & Sons:* F.g.r. of 50*l.*, St. George's-rd., &c., Camberwell, reversion in 118 yrs., 1,500*l.*; 70, 72, 74, and 76, New Church-rd., f., 1,755*l.*; f.g.r. of 7*l.*, Edmund-st., reversion in 9 yrs., 310*l.*; 1 and 3, Edmund-st., f., 385*l.*; 70 and 72, Southampton-st., f., 830*l.*; 31 to 41 odd, Acorn-st., f., 1,080*l.*; 8 to 15, Bachelors Hall-pl., f., 600*l.*; 90, Lambeth-rd., Lambeth, f., r. 50*l.*, 700*l.*; 55, Ethelred-st., f., r. 20*l.*, 420*l.*; 59, High-st., Wandsworth, f., r. 100*l.*, 1,480*l.*; f.g.r. of 15*l.*, Dove Row, Haggerston, reversion in 58 yrs., 325*l.*; l.g.r. of 24*l.* 3s., Loughborough-rd., Brixton, u.t. 28 yrs., 390*l.*—By *G. F. Francis:* 421, Old Ford-rd., Old Ford, freehold licensed premises, r. 48*l.*, 870*l.*—By *C. C. & T. Moore:* 2, 4, 6, and 8, Arcadia-st., Poplar, u.t. 58 yrs., g r. 16*l.*, 660*l.*; 6 and 7, North-st., Mile End, f., 400*l.*—By *J. A. Jones:* 41, Ormeley-rd., Balham, u.t. 94 yrs., g.r. 5*l.* 10s., 255*l.*—By *Thurgood & Martin:* 41, Powis-sq., Notting Hill, u.t. 72 yrs., g.r. 16*l.*, r. 90*l.*, 900*l.*; "Collingdean," Bromley Grove, Shortlands, Kent, u.t. 78 yrs., g.r. 16*l.* 5s., r. 75*l.*, 495*l.*; "Rodmill," u.t. 79 yrs., g.r. 21*l.*, 400*l.*; "Linbank," Shortlands Grove, u.t. 75 yrs., g.r. 34*l.*, 235*l.*

MARCH 29.—By *C. and H. White:* 87, Abbey-st., Bermondsey, f., r. 36*l.* 8s., 340*l.*; 1 and 2, Bennett's-yd., Westminster, f., 180*l.*—By *Wagstaffe & Warman:* 23, 25, and 27, Dagmar-rd., Stroud Green, u.t. 81 yrs., g.r. 18*l.*, r. 102*l.*, 1,075*l.*; 31, Dagmar-rd., u.t. 81 yrs., g.r. 6*l.*, r. 34*l.*, 375*l.*—By *Eastman Bros.:* 70 to 79 (odd), Crofton-rd., Camberwell, u.t. 71 yrs., g.r. 25*l.* 4s., r. 126*l.*, 985*l.*; 81 to 87 (odd), Crofton-rd., u.t. 71 yrs., g.r. 25*l.*, r. 133*l.* 9s. 5*l.*; 101, 103, and 105, Crofton-rd., u.t. 71 yrs., g.r. 18*l.* 18s., r. 66*l.*, 795*l.*; 21 and 22, Kemerton-rd., u.t. 78 yrs., g.r. 11*l.*, r. 52*l.*, 505*l.*—By *Green & Son:* 77 to 89 (odd), Blackstock-rd., Finsbury-pk., u.t. 71 yrs., g.r. 44*l.* 2s., r. 248*l.* 10s., 1,690*l.*—By *Baker & Sons:* Four plots of land, Plevna-rd., Hampton, f., 160*l.*; l.g.r. of 89*l.*, Victoria-pk.-rd., Hackney, u.t. 58 yrs., g.r. 13s., 1,850*l.*—By *W. B. Hallett:* 31, Gascony-av., Kilburn, u.t. 85 yrs., g.r. 10*l.* 10s., r. 42*l.*, 340*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G. ton	8/0/0	9/0/0
Teak, E.I. ..load	10/0/0	16/0/0
Sequola, U.S. ft. cu	1/10	2/2
Ash, Canada load	2/15/0	4/0/0
Birch, do.	2/15/0	4/0/0
Elm, do.	3/10/0	4/15/0
Fir, Dantsic, &c.	1/10/0	3/5/0
Oak, do.	2/15/0	4/15/0
Canada	5/10/0	7/0/0
Pine, Canada red	2/15/0	3/5/0
Do. Yellow	3/5/0	5/10/0
Lath, Dantsic, fath	4/10/0	5/10/0
St. Petersburg..	5/0/0	6/10/0
Wainscot, Riga, &c., log	3/0/0	5/5/0
Odessa, crown	3/0/0	5/5/0
Deals, Finland 2nd & 1st std 100	7/0/0	8/10/0
Do. 4th & 3rd ..	7/0/0	8/0/0
Do. Riga	7/0/0	8/0/0
St. Petersburg, 1st yellow	9/10/0	12/0/0
Do. 2nd yellow	7/10/0	9/0/0
Do. white	8/0/0	9/10/0
Swedish	7/0/0	15/10/0
White Sea	7/10/0	15/0/0
Canada, Pine 1st	21/0/0	24/10/0
Do. do. 2nd	16/10/0	17/10/0
Do. do. 3rd, &c.	8/0/0	10/5/0
Do. Spruce, 1st	8/10/0	10/0/0
Do. do. 3rd and 2nd	6/10/0	7/5/0
New Brunswick	6/0/0	7/0/0
Battens, all kinds	5/0/0	21/0/0
Flooring boards, sq., 1 in. prep. 1st	0/9/0	0/14/0
Do. 2nd	0/6/6	0/11/0
Other qualities—	0/4/6	0/7/0
Cedar, Cuba ..ft.	/3	/4
Honduras, &c.	/3	/4½
Mahogany, Cuba	/3½	/6
St. Domingo, cargo av.	/3½	1/6
Mexican do. do.	/3	/4
Tobasco do. do.	/3½	/6
Honduras do.	/3½	/5½
Box, Turkey ton	4/0/0	15/0/0
Rose, Rio	7/0/0	16/0/0
Bahia	6/0/0	15/0/0
Satin, St. Domingo	0/0/5	0/1/0

TIMBER (*continued*).		
Satin, Porto Rico	0/0/6	0/1/6
Walnut, Italian	0/0/3½	0/0/7
METALS.		
Iron—Pig, in Scotland ....ton	2/1/10	0/0/0
Bar, Welsh, in London	5/12/6	5/13/0
Do. do. at works in Wales	5/2/6	5/3/0
Do. Staffordshire, in London	6/0/0	6/10/0
COPPER—British cake and ingot	42/10/0	43/0/0
Best selected ..	43/0/0	43/10/0
Sheets, strong..	50/0/0	0/0/0
Chili bars	39/11/3	39/16/3
YELLOW METAL ld	0/0/4	0/0/4½
LEAD—Pig, Spanish ....ton	10/0/0	0/0/0
English com. brands	20/2/6	10/3/9
Sheet, English, 6 lbs. per sq. ft. and upwards	10/15/0	11/0/0
Pipe	11/15/0	0/0/0
ZINC—English sheet ....ton	18/10/0	19/0/0
Vieille Montagne	19/10/0	0/0/0
TIN—Straits	64/12/6	65/2/6
Australian	63/15/0	64/5/0
English Ingots	66/10/0	67/0/0
Banca	64/5/0	64/10/0
Billiton	64/2/6	64/12/6
OILS.		
Linseed ....ton	19/0/0	19/5/0
Cocoanut, Cochin	25/10/0	0/0/0
Do. Ceylon	23/0/0	0/0/0
Palm, Lagos	23/10/0	0/0/0
Rapeseed, English pale	22/0/0	22/5/0
Do. brown	20/10/0	20/15/0
Cottonseed ref. ..	17/15/0	18/10/0
Oleine	19/10/0	21/10/0
Lubricating, U.S.	4/0/0	5/0/0
Do. refined	5/0/0	12/0/0
TAR—Stockholm barrel	1/1/0	1/1/6
Archangel	0/16/0	0/0/0

TENDERS.

*** **Next Week** communications for insertion under this heading must reach us *not later than 10 a.m.* on Wednesday, as we go to press a day earlier than usual.

ABER.—For the erection of four shops and houses. Mr. Charles Taylor, architect, 22, Duke-street, Cardiff. Quantities by the architect:—

D. C. Jones & Co.	£2,189	Thomas Rossiter	£1,965
Knox & Wells	2,156	Joseph Thomas	1,834
J. C. Richards	2,060	Griffiths & Co.	1,674
Cox & Bardo	2,051	Thomas Evans	1,558
David Davies	2,035		

ASHTON-UNDER-LYNE.—Accepted for the erection of a pair of villa residences, Richmond-street, for Mr. J. Farrow. Messrs. George & Son, architects, Old-square, Ashton-under-Lyne. Quantities by architects:—

Blacklaying and Excavating.—Jabez Gibson & Son, Dukinfield	£575
Joinery.—Edward Kirkley, Ashton-under-Lyne	310
Masonry.—Garside, Barnes & Co., Stalybridge	149
Slating.—Robert Newton, Symondley	57
Plastering.—Wm. Mellor, Dukinfield	69
Plumbing and Glazing.—J. H. Coop, Ashton-under-Lyne	117 7 6
Painting.—Thos. Catlow, Ashton-under-Lyne	17 10 0

[All with additions.]

AUDENSHAW.—For flagging the north side of Manchester-road from Ashton Hill-lane to the Township Boundary, for the Audenshaw District Council. Mr. J. H. Burton, surveyor, Ashton-under-Lyne:—

Wm. Neal	£442 15 0	H. Kinder, Hooley Hill*	£368 15 0
Underwood & Bro	378 11 8		
Worthington & Pounall	372 3 4		

* Accepted.

COMPETITIONS, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITIONS.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Almshouses	Trustees of late John Henry Fox	20*l.* and 10*l.*	May 13
*School Buildings	Llanelly Intermediate & Technical Schools	.....	May 22

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
House and Offices, Tornahatanach, near Aberdeen	.....	Jenkins & Marr	April 9
Hospital, Ely Schools	Cardiff Union	E. Seward	do.
Stables, Stores, &c. Selby	.....	Mr. Kirby	do.
Gasholder Tank, Great Harwood	Accrington Gas and Water Co.	*Official*	do.
Bridge Work, Loughor Bridge	Glamorgan C. C.	do.	do.
Sewering, Levelling, Paving, &c.	St. Alban's Corp.	do.	do.
Enlargement of Chapel, Greengates, Bradford	.....	Walker & Collinson	April 10
Gymnasium at Grammar School, Carlisle	.....	G. D. Oliver	do.
Villa, near Sunday's Well Church, Cork	.....	S. F. Hynes	do.
Additions to Schools, Inverurie, N.B.	.....	Ellis & Wilson	do.
Alterations, &c. to Farm, Bonnyton, Largo, N.B.	.....	David Storrar	do.
Cottages and Offices, Lusk, co. Dublin	Balrothery Union	C. M. Tuite	do.
School Buildings, Offices, &c. Southampton	Endowed School Govrs.	A. F. Gutteridge	do.
Road Materials, &c. Cardiff	Glamorgan C. C.	T. L. Edwards	do.
Several Tenements, Bell-street	Glasgow Impt. Trust.	*Official*	do.
*Painting Works	Com. of Baths and Washhouses, Islington	do.	April 11
Sixteen Houses, James-street, Worsborough Dale, Barnsley	.....	Wade & Turner	do.
Macadam, Grassendale, Lancs.	Garston U.D.C.	F. W. Bowden	do.
Water Tower, &c. at the Workhouse	Great Yarmouth Union	Mr. Teasdel	April 12
Court House, Ruabon	Denbigh C. C.	R. L. Williams	do.
Houses and Shops, Queen-street, Morley	W. & E. Jackson	T. A. Buttery	April 13
Hotel, Senghenith, near Cardiff	Lewis Morgan	E. H. Bruton	do.
Technical Institute, Eghan	.....	W. Menzies	do.
Storm Drains, Glenarm, &c. Ireland	Antrim County Auth.	J. H. Brett	do.
Road Materials	Hemsworth (Yorks.) R.D.C.	T. H. Richardson	do.
Welsh Granite Setts	Leigh (Lancs.) U.D.C.	T. W. Ratcliffe	do.
Schools, House, &c. Bridge-street	Morley (Yorks.) School Board	Holtom & Fox	do.
Whinstone, Granite, &c. near Halifax	Southowram U.D.C.	*Official*	do.
Additions, &c. to Lake View, Clanmire, co. Cork	.....	R. Walker	April 15
Macadam (1,000 tons) and Kerbs	Warrington Corp.	T. Longdin	do.
Granite Cubes, Bricks, &c.	do.	do.	do.
Granite Road Metal	Chelmsford T. C.	G. H. Sasse	April 16
*Reconstruction of Baths	Bilston U.D.C.	Mr. Wilson, C.E.	do.
Paving Setts, Kerbs, &c. near Stockport	Heaton Norris D.C.	*Official*	do.
Hartshill and other Granite	Wellingborough R.D.C.	do.	do.
Road Works	Portsmouth U.S.A.	do.	April 17
*Granite Cubes and Jarrah Wood Blocks	St. Saviour's Bd. of W.	do.	do.

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Sewering, Paving, &c. Sidney-road, Borstal	Rochester Corp.	W. Banks	April 17
Thirty-two Houses, Penydarren, Merthyr Tydfil	Gellyfaelog Building Club	J. Williams	April 18
Business Premises, Market-street, Lurgan, Ireland	D. Malcolinson	H. Hobart	do.
Additions, &c. to Hospital, Vesta-street, Ancoats, Manchester	M. S. & L. Ry.	*Official*	do.
Two Houses and Eight Cottages, Mirfield, Yorks.	.....	Reuben Castle'	April 19
*Main Drainage Works	Caversham U.D.C.	N. Lailey	do.
School, near Wickham Market	Friston School Board	E. Rope	do.
*Staff's Quarters, Rotherhithe	Met. Asylum Board	T. W. Aldwinckle	April 20
Road Works, Arnott-street	Walton-on-Hill U.D.C.	S. Middlebrook	April 22
*Service Reservoir	Kettering Waterworks Co.	T. Hennell	do.
*Road Works	Hendon U.D.C.	S. S. Grimley	do.
*Superstructure of Extension of Asylum	Newcastle-upon-Tyne Lunatic Asylum	J. W. Dyson	April 23
*Ironwork for Sewers	Cambridge Corp.	J. T. Wood	do.
*Painting, &c. at Workhouse	Chelsea Vestry	Lansdell & Harrison	do.
*Caretaker's Cottage	Wimbledon U.D.C.	*Official*	do.
*Post Office, Tunbridge Wells	Com. of H. M. Works	do.	April 26
*Underground Conveniences	Com. of Sewers (City of London)	do.	April 30
*Machinery, &c.	Borough of West Ham	Lewis Angell	May 14
Engine House, &c. Charlie Pit, Durham	South Moor Colliery Co. Ltd.	*Official*	No date
Granite Setts (2,000 tons)	Manchester Corp.	do.	do.
*Trial Boring for Water	St. Paul's (Deptford) Parish	T. Dinwiddy	do.
Alterations, &c. to Old Spacey House Inn, Pannal, Yorks.	A. Holmes	Swale & Mitchell	do.
Schools, Brook-street	Carlisle School Board	T. T. Scott	do.
Stabling, Coachhouse, &c. Carlisle	F. Robinson	G. D. Oliver	do.
Additions to Hide Market, Hereford	Harrison & Bowen	W. W. Robinson	do.
House, Wellington Park, Belfast	Misses Neill	.....	do.
*White Sawdust	London Tramways Co. Ltd.	.....	do.
Residence, Croft-place, Alnwick	.....	G. Renvell	do.
Fifty Houses, Ashton-under-Lyne	.....	T. D. Lindley	do.
Two Houses and Shops, New Barnet	.....	J. White	do.
House, Mapperley Park Estate, Nottingham	.....	A. H. Goodpall	do.
Primitive Methodist Church and Schools, Ann's-road, Heeley, Sheffield	.....	W. J. Taylor	do.
Wesleyan Church and Schools, Bramhope, Yorks.	.....	W. S. Morley	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Assistant Surveyor	Croydon R.D.C.	150*l.*	April 10
*Building Inspector	Enfield U.D.C.	2*l.* 2*s.*	do.
*Surveyor, Sanitary Inspector, &c.	Sandgate U.D.C.	130*l.*	April 15
*Surveyor	Worksop U.D.C.	120*l.*	April 22

Those marked with an asterisk (*) are advertised in this Number. Competitions, p. iv. *Contracts, pp.* iv., vi., viii., *and* xxi. *Public Appointments, p.* xviii. *and* xix.

BECCLES.—For the erection of a house in the Upper Grange-road, Beccles, Suffolk, for the Misses Coleman. Mr. F. E. Banham, architect:—

F. J. Allen	£315 5	G. A. Dunn, Beccles*	£311 10

* Accepted.

BECCLES.—For the erection of a house in the London-road, Beccles, Suffolk, for Mr. A. R. Block. Mr. F. E. Banham, architect:—

G. A. Dunn	£638 0	E. W. Hindes	£560 0
F. A. Woodroffe	598 10	F. J. Allen, Beccles*	508 7

* Accepted.

BELPER.—For additions to school buildings, Long-row, for the School Board. Mr. Maurice Hunter, architect, Belper:—

Ben Bodell	£2,113 0 0	Jos. Walker	£1,920 0 0
Ford & Co.	2,077 12 9	Wheeldon Bros., Belper (accepted).	1,900 0 0
L. T. Wildgoose	2,000 0 0		
A. Hingley	1,997 0 0		

BRADFORD.—Accepted for additions, &c., to house and shop, Otley-road. Messrs. L. Leadley & Son, architects, 3, Coleridge-place, Bradford:—

Masonry.—Geo. Hullah, Wapping-road, Bradford
Joinery.—Broadhead & Pickering, Bradford
Plumbing.—Jon. Neal, Bower-street, Bradford
Plastering.—Matthew Bland, Butler-street, Bradford
Slating.—Hill & Nelson, Bradford
Ironwork.—Taylor & Parsons, Bradford
} £440

BROCKLEY.—For the erection of a shop and premises at Crofton Park, Brockley. Mr. E. Tompkins, architect:—

H. Joyce	£740 0 0	Wilkinson & Sons, Notting Hill*	£625 0 0
C. Marriot	638 0 0	J. A. Johnson	610 0 0
G. A. Chapman	635 11 0		

* Accepted.

BRUNTCLIFFE (Yorks.).—For the erection of chapel and school buildings, for the Primitive Methodist Society. Mr. T. A. Buttery, architect, Queen-street, Morley:—

Masonry.—J. & J. Sugden, Morley	£521 0
Joinery.—T. Akeroyd, Bruntcliffe	282 0
Plastering.—J. Bentley, Howdenclough	57 1
Slating.—Sharp & Harper, Bath-road, Leeds	29 0
Plumbing.—A. Cooper, Dreghlington	19 9

CANNOCK (Staffs.).—For the construction of about 1,000 yards of 9-in. and 6-in. earthenware pipe sewers, &c., for the Rural District Council. Mr. J. Edward Wilcox, C.E., Union Chambers, Temple-row, Birmingham:—

Currall, Lewis, & Martin	£597 10 0	George Law	£499 0 0
Henry Law	552 0 0	H. Holloway	487 0 0
F. J. Smith	522 16 0	C. I. Nevitt, Stafford*	419 13 7

* Accepted.
[Engineer's estimate, £450.]

BUNGAY.—Accepted for the erection of eight almshouses in the Outney-road, Bungay, Suffolk, for Mr. F. Smith. Mr. F. E. Banham, architect:—

F. J. Allen	£1,302 11

CANTERBURY.—For additions, &c., to school buildings, St. John's-lane, for the School Board. Mr. W. J. Jennings, architect, 4, St. Margaret's-street, Canterbury. Quantities by architect:—

W. W. Martin	£1,377 13	K. Knock	£1,134 0
Paramour & Sons	1,950 0	J. J. Hall	1,049 10
F. T. Gentry	1,215 0	A. J. Brewster	1,049 0
H. B. Wilson	1,212 0	W. Judges, Boughton*	879 10
W. J. Adcock	1,170 0		
L. Seager	1,137 0		

* Accepted.

DUMBARTON (N.B.).—For paving half-a-mile of roadway, West Bridgend; also for supplying and laying 200 yds. fire-clay sewer-pipes, for the Commissioners. Mr. John T. Babtie, C.E., 37, Church-street, Dumbarton:—

John A. Paton	£3,282	William Lang	£3,199
Alex. Stark & Sons	3,280	J. & J. Neilson	3,076
Daniel Murray	3,270	John Freebairn, Kelsyth*	2,947

* Accepted.
[Ten offers were received for the Contract.]

DORCHESTER.—Accepted for rebuilding shops and premises, High East-street, for Colonel R. Williams. Mr. A. L. T. Tilley, architect, 16, Cornhill, Dorchester:—

W. Griffin, Broadstone, Dorset	£1,695

EDMONTON.—For new school at Raynham-road, upper Edmonton, for the School Board for Edmonton. Mr. P. B. Freeman, architect, 3, Staple-inn, Holborn. Quantities by Messrs. Young & Brown:—

Fredk. Britton	£22,086	Allen, Fairhead, & Son	£19,448
W. Goodman	21,028	J. Parnell & Son	19,229
Arthur Porter	21,000	Treasure & Son	19,056
J. Wilmott & Sons	20,919	E. Lawrance & Sons	19,043
J. Jarvis & Son	20,616	Kirk & Randall	18,957
Battley, Son, & Holness	20,371	Percival Hart	18,356
J. White & Son	20,100	Wm. Shepherd	17,988
J. Longley & Co.	19,900	G. Godson & Sons	17,960
B. E. Nightingale	19,690	C. Gray Hill (Coventry)*	17,720

* Accepted.

ELLAND (Yorks.).—For alterations, &c., to the offices of the Urban District Council. Messrs. Horsfall & Williams, architects, 15, George-street, Halifax:—

Masonry.—Birkby & Son, Wyke	£365 0
Joinery.—J. E. Crowther, Elland	151 3
Slating.—Bancroft & Son, Halifax	71 11
Plumbing.—J. Naylor & Son, Halifax	50 0

FENTON (Staffs.).—For the supply of broken granite and paving bricks for the Urban District Council. Mr. S. A. Goodall, Surveyor, Town-hall, Fenton:—

Accepted Tenders for Broken Stone.

	Per ton. s. d.
Darbishires, Ltd., Penmaenmawr	11 0—hand or machine broken.
Whitwick Granite Co., Ltd., Coalville	9 10—hand broken.
" " "	9 3—machine broken.

[All delivered at Fenton.]

FORREY (Cornwall)—Accepted for building villa residences at Forrey, 4th block, for Mr. W. Gundry. Mr. Sampson Hill, architect, Redruth:—

N. Penter, Polruan	£1,270

GLOUCESTER.—For the erection of malt-house, &c., at the Docks, for Messrs. G. & W. E. Downing. Mr. Walter B. Wood, architect, 12, Queen-street. Quantities by Mr. F. E. Godwin, Heathville-road, Gloucester:—

A. H. Forse	£7,950	Claridge & Bloxham	£6,587
G. H. Wilkins	7,373	Wilcocks & Co.	6,585
D. C. Jones & Co.	7,166	T. Lowe & Sons	6,100
W. Jones & Son	6,970	Gurney, Bros., Gloucester (accepted)	5,797
S. & W. Pattinson	6,854		

GODALMING.—For the erection of cemetery chapels, lodge, &c., Eashing-lane, for the Burial Board. Messrs. Welman & Street, architects, Church-street, Godalming. Quantities by architects:—

W. Smith	£3,150	F. Milton	£2,796
Mitchell Bros.	3,147	Peters & Son	2,735
T. F. Hall	3,140	G. Horn	2,644
T. Kingerlee	2,867	Harris & Son, Woking*	2,625

* Accepted.

GREENOCK (N.B.).—For levelling Firmart's-lane, for the Board of Police. Mr. Alex. J. E. Turnbull, C.E., Borough Surveyor. Quantities by Engineer:—

D. K. McPherson	£167 18 5	James Walker, Greenock*	£66 0
R. Aitkenhead & Son	96 0 0		
Wm. Pollock	76 19 1		

* Accepted.

HARROW.—For the erection of business premises for Mr. D. T. Rigden. Mr. W. Jennings, architect, Canterbury. Quantities by architect:—

H. Somerford & Son	£1,218	F. T. Chinchen	£988
J. Willmott & Son	1,135	W. A. Pryor	959
W. Sumner & Co.	1,088	W. J. Adcock	896
T. Turner	1,085	W. Fortescue, 181, Queen Victoria-st., London, E.C.*	877
G. Godson & Sons	1,050		
C. Brightman	1,049		

* Accepted.

ILFORD (Essex).—For new Board school, cookery centre, and caretaker's cottage, Cleveland-road, for the Ilford School Board. Mr. C. J. Dawson, architect, Barking. Quantities by Messrs. Gardner, Son, & Theobald :—

Oldridge & Sons	£27,329	Lansdowne & Co.	£21,952
Thomas Boyce	25,466	W. Watson	21,858
Stephens, Bastow, & Co.	25,000	Holloway Bros.	21,808
Foster & Dicksee	24,060	Holland & Hannen	21,808
Hammond & Son	22,270	Gregar & Son	21,516
Rider & Son	22 047	Mowlem & Co.	21,260
Holliday & Greenwood	22,044	W. Shepherd	20,988
F. J. Coxhead	21,997	Kirk & Randall*	22,844

* Accepted subject to sanction of Education Department.

KING'S LYNN.—For the erection of steam laundry, &c., Gaywood, for Messrs. C. G. Barrett & Co. Mr. Jno. R. Fayers, architect, Market-place, King's Lynn :—

Read & Wildbur	£1,079 7	Collins & Barber, Downham Market (accepted)	£892 0
R. W. Fayers	1,002 4		
W. H. Brown	999 0		

LONDON.—For erecting a new department for infants on the site in Waterloo-street, Hammersmith, to provide accommodation for 490 children (the net additional accommodation for the infants' department being 199 places) and for other work, for the School Board for London. Mr. T. J. Bailey, Architect :—

I. Shillitoe & Son	£12,230	J. Longley & Co.	£10,807
Holliday & Greenwood	11,604	B. E. Nightingale	10,798
W. Downs	11,420	C. Cox	10,250
Holloway Bros.	11,345	E. Lawrence & Sons, Wharf-road, City-road, N.*	10,154
Lathey Bros.	11,273		
B. A. Yerbury & Sons	11,112		
Atherton & Latta	10,950		

* Recommended for acceptance by the Works Committee.

LONDON.—For the erection of a school on the site in Fircroft-road, Tooting, to provide accommodation for 812 children, and for the erection of a schoolkeeper's house, with a cookery and laundry centre combined, and a manual training centre, for the School Board for London. Mr. T. J. Bailey, Architect :—

Atherton & Latta	£22,623	G. E. Wallis & Sons	£19,586
Grover & Son	20,115	Stimpson & Co.	19,499
Holliday & Greenwood	20,079	E. Lawrance & Sons, Wharf-road, City-road, N.*	19,102
Lathey Bros.	20,048		
Hart Bros.	27,036	W. Gregar & Son†	18,756
Holloway Bros.	19,914		
W. Downs	19,679		

* Recommended for acceptance by the Works Committee.

† Messrs. Gregar & Son, in submitting their tender, stated that three of the bills of quantities were not supplied to them, and that no provision for these bills had therefore been made in the amount of their tender.

LONDON.—For rebuilding the offices of the boys' department of the Fleet-road School, Hampstead, and also for enlarging the offices of the junior mixed department, for the School Board for London. Mr. T. J. Bailey, Architect :—

S. Polden	£759	Marchant & Hirst	£619
Vernall, Danes, & Co.	750	McCormick & Sons, Canonbury-road*	605
G. Neal	649	T. Cruwys	289
Cowley & Drake	635		
Stevens Bros.	622		

* Recommended for acceptance by the Works Committee.

LONDON.—For erecting a manual training centre in connexion with the Ackmar-road School, Parson's Green, and for other work, for the School Board for London. Mr. T. J. Bailey, Architect :—

T. Gough & Co.	£1,214 0 0	W. Hammond	£1,054 0 0
G. Neal	1,151 0 0	J. Garrett & Son	1,046 10 0
F. T. Chinchen	1,139 0 0	R. A. Yerbury & Sons, Kilburn*	1,019 10 0
J. Otway	1,128 0 0		
G. Lyford	1,106 14 1		

* Recommended for acceptance by the Works Committee.

LONDON.—For erecting a school for special instruction in connexion with the Galleywall-road School, Bermondsey, and for other work, for the School Board for London. Mr. T. J. Bailey, Architect :—

J. Smith & Sons	£3,597	J. Marsland	£3,292
J. & C. Bowyer	3,481	Holloway Bros.	3 276
J. Shillitoe & Son	3,448	W. Downs	3,2 0
Holliday & Greenwood	3,434	Hart Bros.	3,129
F. & H. F. Higgs	3,324	B. E. Nightingale	3,041
Mid-Kent Building and Contracting Works, Ltd.	3,314	E. Lawrance & Sons, Wharf-road, City-road*	3,019

* Recommended for acceptance by the Works Committee.

LONDON.—For reconstructing the offices of all departments of the High-street School, Bromley, and for providing the new system of drainage, for the School Board for London. Mr. T. J. Bailey, Architect :—

M. Calman & Co.	£1,491	Vernell, Danes, & Co.	£1,367
Stevens Bros.	1,410	J. T. Robey, 194, Bow-road, E.	1,290
G. Parker	1,375		

* Recommended for acceptance by the Works Committee.

LONDON.—For reconstructing and enlarging the boys' offices and urinals on the roof playground of the Teesdale-street School, Bethnal-green, for the School Board for London. Mr. T. J. Bailey, Architect :—

J. T. Robey	£316	H. J. Williams, Great Dover-street, Borough*	£139
Davis Bros.	315		
S. Polden	295		

* Recommended for acceptance by the Works Committee.

LONDON.—For carrying out alterations to the school buildings in Abbey-street Schools, Bethnal Green, in order to adapt them for the purposes of cookery, laundry, manual training, and housewifery centres, and also as a school for special instruction, and for drainage works, for the School Board for London. Mr. T. J. Bailey, Architect :—

G. S. S. Williams & Sons	£4,285	Willmott & Sons	£3,850
Reed & Son	4,204	W. Gregar & Son*	3,837
Grover & Son	3,994	Calnan & Co.	2,976
Lawrance & Sons	3,875		

* Recommended by the Works Committee for acceptance.

LONDON.—For erecting a manual training centre (on arches) in connexion with the Cobourg-road School, Old Kent-road, for the School Board for London. Mr. T. J. Bailey, Architect :—

Mid-Kent Building & Contracting Works, Ltd.	£1,507	J. Marsland	£1,377
J. & C. Bowyer	1,463	L. Whitehead & Co., Clapham-road, S.W.*	1,298
J. Garrett & Son	1,428		

* Recommended for acceptance by the Works Committee.

LONDON.—For providing new water-closets for the blind children, and for the teachers of the Wornington-road School, Portobello-road, and also for providing a new lavatory and covered playground for the boys' department, for the School Board for London. Mr. T. J. Bailey, Architect :—

G. Neal	£635 0	H. C. Clifton, Porchester-road, Bayswater*	£417 0
G. Lyford	512 11		

* Recommended by the Works Committee for acceptance.

LONDON.—For providing and fixing cooking-apparatus, with the necessary steam boilers, and also for providing steam boiler and heater for supplying hot water to swimming baths, lavatories, &c., at the school building in Drury-lane, for the School Board for London. Mr T. J. Bailey, Architect :—

Purcell & Nobbs	£1,676 0 0	J. & F. May	£803 0 0
Carron Co.	998 17 6	Benham & Sons, Ltd	795 0 0
W. G. Cannon & Sons	950 0 0	J. Fraser & Son	746 0 0
Wontner, Smith, Gray, & Co.	815 0 0	T. Potter & Son, Ltd.	730 0 0
		J. F. Clarke & Sons, Moorgate-street	539 0 0

The Works Committee recommend the acceptance of the lowest tender.

LONDON.—For laying asphalte pavements in Endell-street and several others, for the Board of Works for the St. Giles's District. Mr. Geo. Wallace, Engineer :—

Endell-street, Great Coram-street.

The French Asphalte Paving Co., Laurence Poultney Hill, E.C.*

Maynard-street, Neal's-yard.

The Limmer Asphalte Paving Co., 2, Moorgate-street, E.C.*

Shaftesbury Avenue, Caroline Mews.

The Val de Travers Asphalte Paving Co., Old Broad-street., E.C.*

* Accepted at schedules of prices.

LONDON.—For roughly forming Conington-road and sewer therein, Greenwich. Mr. T. Dinwiddy, F.S.I., surveyor :—

Wood	£608	W. Mills (accepted)	£540

LONDON.—Accepted for factory gates and alterations at Silk Mills, Lewisham, for Messrs. Stanton. Mr. T. Dinwiddy, architect :—

Wood	£450

LONDON.—For the removal of the iron columns, &c., supporting the boiler-house roof of the Crossness Pumping-station, for the London County Council :—

H. Young & Co.	£649 0 0	Fraser & Fraser, Lim.	£390 7 10
J. Lysaght, Lim.	368 7 11		

LONDON.—For proposed rebuilding of "The Globe" public-house, Borough-road, S.E., for Mr. George Evans. Mr. W. M. Brutton, architect. Quantities by Mr. Walter Woodison :—

Rowe	£2,350	Whitehead	£2,220
Courtney & Fairbairn	2,257	Edwards & Medway	2,216
T. Hooper	2,239	Holloway	2,220

LUTON.—For residence, shop, and bakehouse, Crawley-road, for Mr. D. Starkings. Mr. A. Wilkinson, architect :—

J. Saunders	£1,456	G. Smart	£1,200
D. Parkins	1,295	G. Kingham*	985

[All of Luton.]

*Accepted subject to amendment.

LUTON.—For residence and stabling, Dunstable-road, for Mr. W. Withington. Mr. A. Wilkinson, Cardiff-road, architect.

W. G. Dunham	£997	J. Saunders	£810
D. Parkins	887	G. Smart (accepted)	735

[All of Luton.]

MALDON (Essex).—For supplying and laying 700 yards c.i. water-mains, Steeple-road, Southminster, for the Rural District Council. Mr. H. G. Keywood, C.E., Market-hill, Maldon :—

Alfred Williams & Co.	£113 13 9	Camping & King,	£79 0 0
Furlong & Son	110 0 0	A. M. Cook, Burnham-on-Crouch*	75 6 6
James Harvey	100 18 0	J. Pratt	74 10 0
Charles Lewis	81 7 6		

* Accepted.

MORLEY (Yorks.).—Accepted for the erection of mill premises, Brentcliffe-lane, for Mr. B. P. Hepworth. Mr. T. A. Buttery, architect, Exchange Buildings, Queen-street, Morley. Quantities by the architect :—

Masonry, Bricklaying, and Excavating.—J. Clegg & Sons, Wesley-street, Morley	£2,540 0 0
Plumbing.—William Auty, Chopell Hill, Morley	58 17 0
Ironfounding.—E. & W. Haley, Bradford	435 0 0
Concreting.—John Bently, Howdenclough	247 0 0
Slating.—John Atkinson & Son, Leeds	407 0 0
Total	£3,687 17 0

MORLEY (Yorks.).—For the erection of hall and reading-rooms, Fountain-street, for the Temperance Society. Mr. T. A. Buttery, architect, Queen-street, Morley :—

Masonry.—D. Furness, Morley	£750 0
Joinery.—J. Hook, Armley	352 0
Plastering.—E. Wilson, Morley	125 0
Plumbing.—M. A. Naylor, Morley	70 0
Slating.—J. Atkinson & Son, Leeds	50 9

MORLEY (Yorks.).—For the erection of two villa residences, Dean Hall-estate. Mr. T. A. Buttery, architect, Queen-street, Morley :—

Mr. Albert Bradley's Villa.

Masonry.—J. & J. Sugden, Morley	£400 0 0
Joinery.—J. Clegg & Sons, Morley	205 0 0
Plastering.—J. & W. Bates, Bradford	63 0 0
Plumbing.—G. A. Firth, Morley	79 0 0
Slating.—J. Atkinson & Son, Leeds	50 10 0

Mr. J. T. Horsfall's Villa.

Masonry.—Newton & Asquith, Morley	£320 0 0
Joinery.—J. Clegg & Sons, Morley	200 0 0
Plumbing.—J. Wilby, Gildersome	83 17 8
Plastering.—J. Bentley, Howdenclough	64 8 0
Slating.—J. Atkinson & Son, Leeds	71 17 0

NEWPORT.—For additions to Stow Hill Schools, for the Newport, Mon., School Board. Mr. Benj. Lawrence, architect :—

John Moore	£1,975	John Linton	£1,599
T. Westacott	1,807	Wm. Price	1,590
C. H. Reed	1,800	Jas. Davies	1,549
J. H. Firbank	1,654	E. C. Jordan	1,545
A. T. Morris	1,640	A. S. Morgan & Co.	1,499
T. G. Diamond	1,600	Dyson Pasfitt (accepted)	1,480
John Jenkins	1,625		

[All of Newport.]

OTLEY.—For the erection of a pair of semi-detached villa-residences. Messrs. Fairbank & Wall, architects, 3, Manor-square, Otley :—

Masonry.—J. Norfolk	£1,603 10 6
Joinery.—P. Patrick	
Plumbing.—G. Farrand	
Plastering.—Chaffer Bros.	
Slating.—W. Walker	

[All of Otley.]

REDRUTH.—For alterations and additions to schools, for the Redruth School Board. Mr. Sampson Hill, architect, Redruth :—

Trewirgie.

Hodge & Head, Redruth (accepted)	£576 10

East End.

A. Nichols & Son, Redruth (accepted)	225 0

Treleigh.

Moyle & Mitchell, Chacewater (accepted)	416 17

RYDE.—For new dining-room and other additions at The Castle, Ryde, for Colonel E. W. Cradock, J.P., C.C. Mr. John J. Barton, architect, Ryde :—

C. Langdon	£885 0	J. Barton	£793 0
E. James	798 10	J. Whitewood, Ryde*	773 0

* Accepted.

ST. ANDREWS (N.B.).—Accepted for the construction of relief sewerage works, Gibson-place, &c., for the Magistrates and Council. Mr. Henry Bruce, C.E., County-buildings, Cupar :—

General Contract.—Robt. Gilmour	£302 17 0
Ironwork.—The Glenfield Co., ironfounders, Kilmarnock	27 19 8
Total	£330 16 8

STOURBRIDGE.—For the construction of the first section of high-level main outfall sewer, Whittington, near Kinver, with branches, for the Upper Stour Valley Main Sewerage Board. Messrs. Marten & Fiddian, joint engineers, Church-street Chambers, Stourbridge :—

Jones & Fitzmaurice	£30,624 0 0	Henry Hill	£21,176 11 0
J. & T. Binns	28,516 18 11	Thomas Vale	20,793 0 0
Curral & Lewis	27,339 16 2	George Bell	19,150 0 0
H. Holloway	24,558 19 6	Herbert Weldon	18,755 7 9
John Guest & Sons	23,516 0 0	R. C. Brebner	17,413 9 11
Jacob Biggs	21,831 0 0	John Mackay, Smethwick*	16,327 11 6
George Law	21,499 0 0		

* Accepted.

TRURO.—Accepted for the erection of three houses, Malpas, for Messrs. Wm. Burley & Bros. Mr. Wm. Swift, architect, care of Messrs. Henderson & Son, 31, Lemon-street, Truro :—

Masonry.—R. H. Tonkin, Tregoney	£351
Carpentry and other trades.—C. & J. Harris, Truro	229

WAKEFIELD.—Accepted for the execution of sewerage works, &c. (four contracts), for the Rural District Council. Mr. Frank Massey, C.E., Tetley House, Kirkgate, Wakefield :—

East Ardsley Drainage.—Contract No. 4.

Matthew Arundel, East Ardsley	£465 5 2

East Ardsley Drainage.—Contract No. 6.

Squire Booth, Earlsheaton	£1,168 12 0

Crigglestone Drainage.—Contract No. 1.

T. & G. Wilson, Wakefield	£3,027 5 0

WALMER.—For alterations to the Union Club. Mr. T. Dinwiddy, architect :—

Denne & Son	£165 10	Cottew (accepted)	£155 10
Wise	160 0		

WATFORD.—For levelling, sewering, and making Acme and Leavesden-roads, Watford. Messrs. Humbert, Son, & Flint, Surveyors, Watford, and Lincoln's Inn, London, W.C. :—

Clifford & Gough	£566	G. Mann	£530
G. Pitkin	554	G. Blizzard	495
W. I. Griffin	550	Wm. Judge, Watford (accepted)	475
F. Dupont	545		

SUTTON (Surrey).—For the execution of road works, Church-road, and nine others. Mr. Albert D. Greatorex, C.E., Surveyor, Council Offices, Sutton :—

	Church-road.	Church-street.	Elm-grove.	Hill-road.	Lavender-road.	Manor-place.	Pellatt-road.	St. Barnabas-road.	St. James'-road.	Woodside-road.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
T. Adams	301 4 11	155 19 6	114 1 7	263 2 2	179 15 0	148 17 4	252 12 0	763 7 10	924 19 7	305 9 6
W. Coker	431 1 9	161 5 10	211 0 4	397 1 9	250 19 0	197 9 6	449 14 0	1180 8 0	1454 1 0	723 18 0
S. Hudson	427 5 11½	198 19 2	188 3 1	369 18 3½	259 4 8	208 16 3	336 17 6	1083 2 4	1237 3 11	561 19 0
J. Jackson	440 14 4	213 14 0	142 1 11	401 3 1	271 13 5	191 10 10	345 3 0	1075 9 3	1191 6 4	609 9 2
W. Jenner	247 4 5	137 0 10	87 15 3	228 3 8	157 1 11	126 19 8	227 7 1	695 18 5	827 13 1	346 1 1
S. Kavanagh	323 14 4	151 7 9	144 13 7	267 7 10	188 12 6	148 15 1	259 9 4	759 2 10	924 17 9	428 9 4
W. Langridge	352 9 0	207 14 2	127 7 5	365 7 10	215 13 5	184 4 9	317 18 8	696 4 7	813 14 10	—
C. McGee	263 1 2	137 4 0	120 5 6½	262 12 4	188 9 11	140 3 7½	256 6 7	736 14 0	860 2 8	419 9 5
Mayo & Co.	270 17 0	151 4 9	82 14 9	224 12 2	160 3 7	127 5 11	275 19 0	670 16 4	796 16 5	387 19 3
Robertson & Grant	382 13 6	163 11 11	163 2 3	335 14 6	234 15 10	182 7 10	326 9 10	967 9 1	1090 14 3	547 8 0
Saunders & Co.	275 12 5	144 6 7	104 13 8	241 18 3	175 12 2	131 3 6	245 18 7	723 14 5	872 8 7	398 13 0
J. Trueman	333 0 0	151 0 0	142 0 0	362 0 0	199 0 0	163 0 0	284 0 0	827 0 0	999 0 0	450 0 0
Wadey & Co.	374 0 6	195 3 11	191 8 6	347 19 10	224 0 5	209 16 10	354 15 9	991 5 0	1112 12 5	500 6 11
W. H. Wheeler	267 2 11	123 12 8	75 15 6	236 19 8	162 6 7	125 12 5	216 4 2	666 17 4	776 11 7	364 19 2
T. Tree & Son	254 10 4	118 11 3	91 14 0	231 0 0	163 4 10	139 15 5	226 2 11	682 4 3	915 18 8	405 5 4
Surveyor's estimate	300 0 0	150 0 0	80 0 0	260 0 0	183 0 0	145 0 0	250 0 0	710 0 0	850 0 0	380 0 0

WATFORD.—For sewering and making Rosslyn-road, Watford. Messrs. Humbert, Son, & Flint, surveyors, Watford, and 11, Serle street, Lincoln's Inn, London, W.C. :—

E. Rogers & Co.	£740	G. R. Mann	£537
T. Adams	656	Geo. Blizzard	525
W. J. Griffin	588	Wm. Judge, Watford*	515
F. Dupont	570		

* Accepted.

WESTON-SUPER-MARE.—For the erection of a dairy factory, Wortley-place. Mr. Bray, architect, Weston-super-Mare :—

C. Taylor	£791	C. Addicott	£750
W. Dubin	780	H. Shorney (accepted)	665

[All of Weston-super-Mare.]

WOODFORD.—For the erection of a dwelling-house in Churchfields, for Mr. R. N. Salter. Mr. J. Walter Wyles, P.A.S.I., architect, 17, Finsbury-pavement, E.C. :—

Mundy	£1,250	Jolliffe	£1,018
Reed	1,139	Osborn & Sons	993
Catley	1,070	Slow & Punter*	925

* Accepted with modification.

WORCESTER. — For alterations and additions to Draycott House, near Worcester, for Colonel Scott, R.A. Mr. A. William West, architect, 44B, Maddox-street, W. :—

Steed, London	£2,077	J. Wood & Sons.	£1,779
Underhill, Worcester	1,847	Bromage & Evans	1,071
Stokes & Sons	1,779		

WORKINGTON.—For the execution of sewerage works, &c., Gray-street, for the Urban Sanitary Authority. Mr. Wm. L. Eaglesfield, Borough Surveyor, Workington :—

Jas. Taylor & Son	£383 1 9	Jas. Atkinson*	£320 0 0
John Birkett	380 5 0		

* Accepted.

[All of Workington.]

WORKINGTON. — For the execution of sewerage works, Harrington-road, for the Urban Sanitary Authority. Mr. Wm. L. Eaglesfield, Borough Surveyor, Town-hall, Workington. Quantities by the Borough Surveyor :—

J. T. Harrison	£820 18 2
Jas. Taylor & Son, Workington (accepted)	788 11 0

CLEANING AND PAINTING AT THE EDINBURGH-ROAD SCHOOLS, LONDON.—In the list of tenders for this work which we published last week, the name of Marchant & Hirst was omitted. The amount of their tender was £179.

PUBLISHER'S NOTICES.

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Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the front Page should be in by TWELVE noon on WEDNESDAY.

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The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

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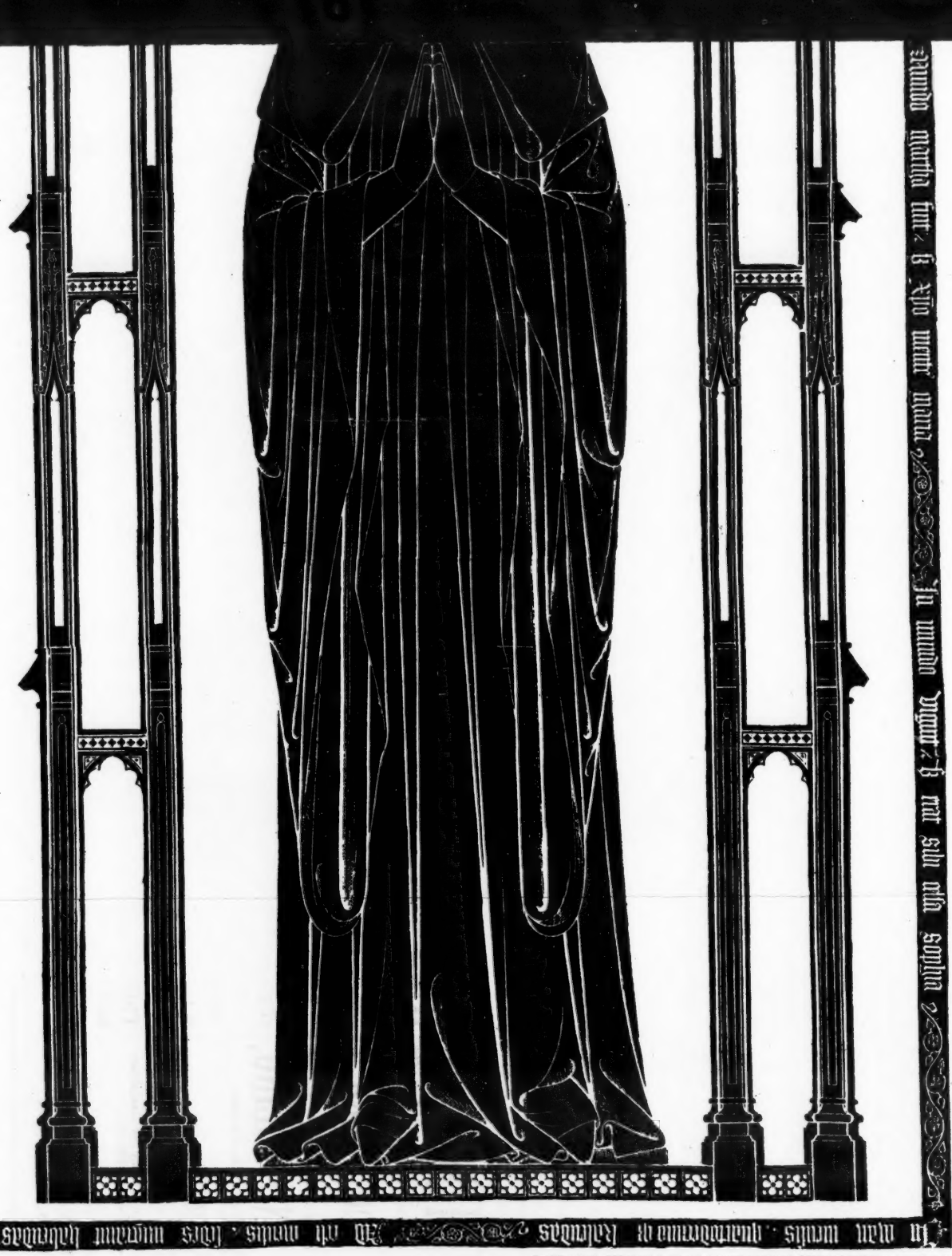

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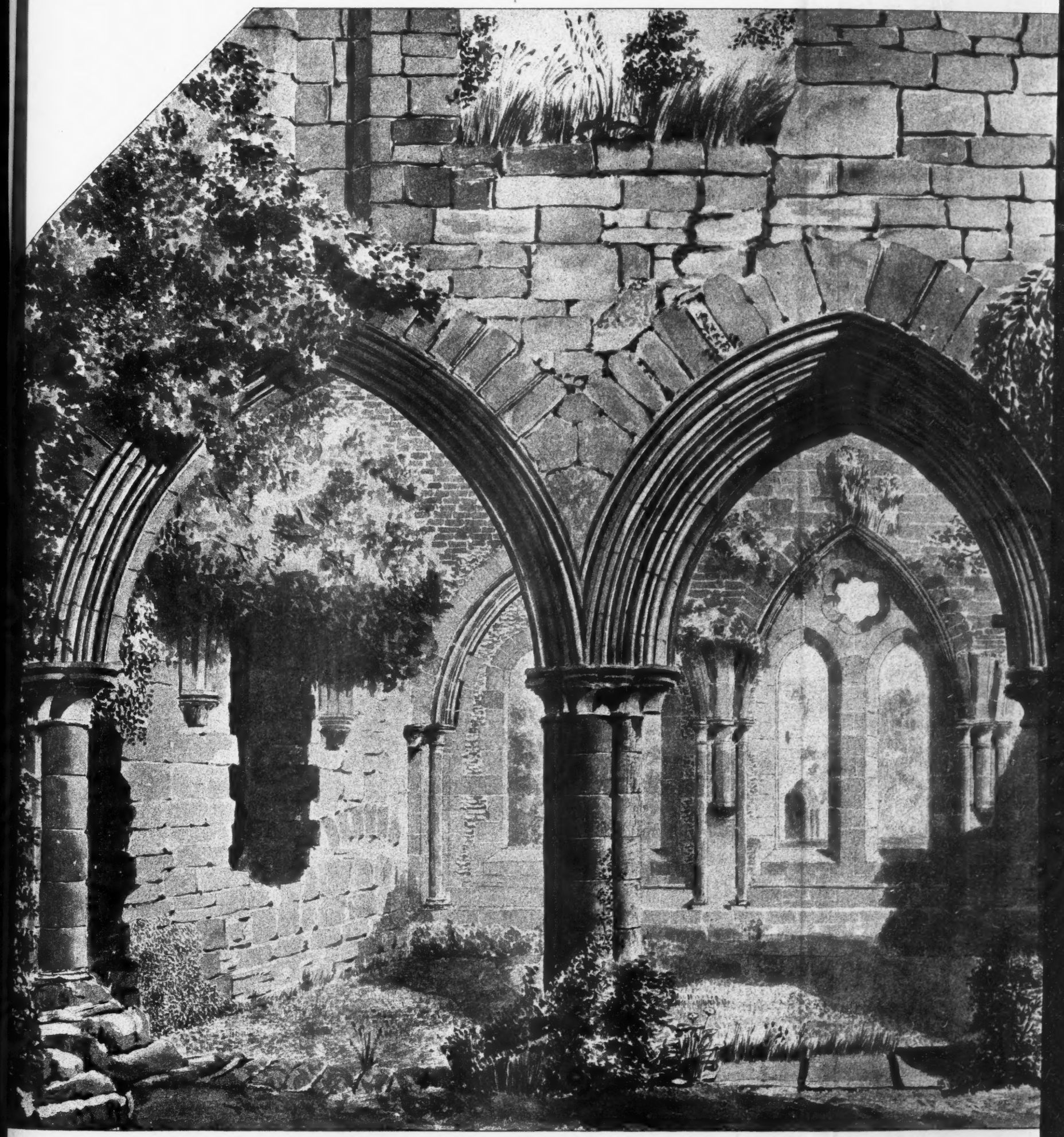

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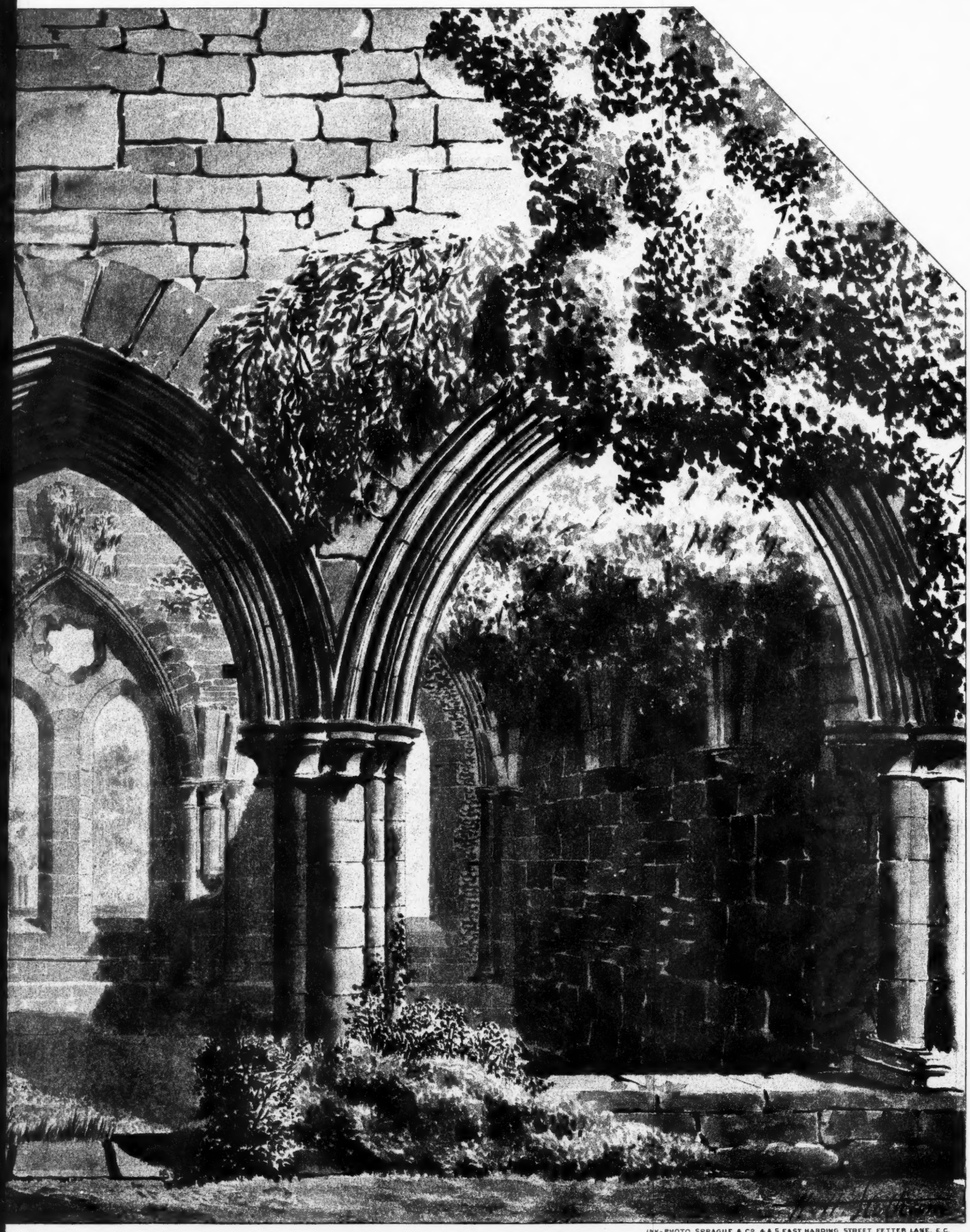

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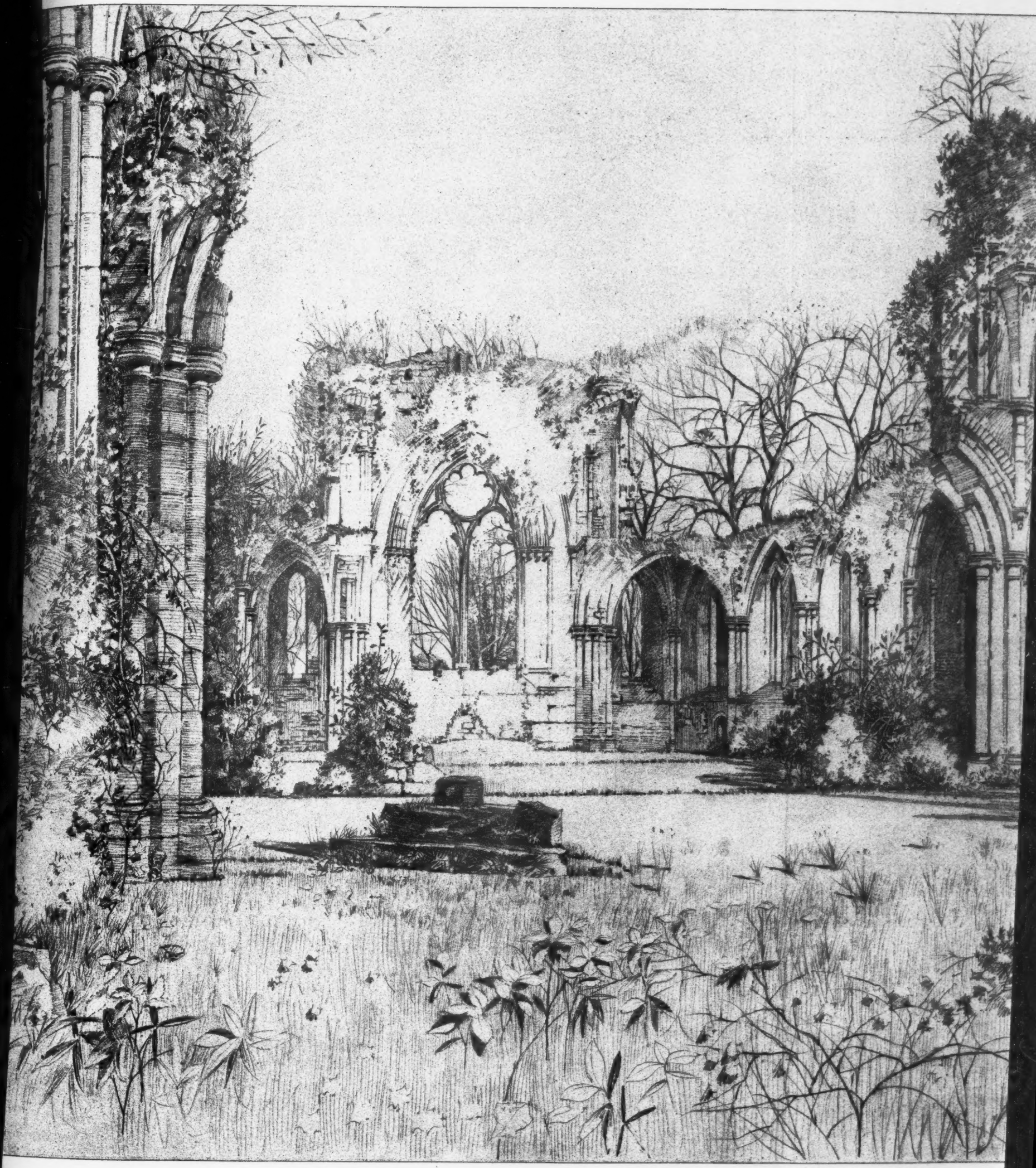

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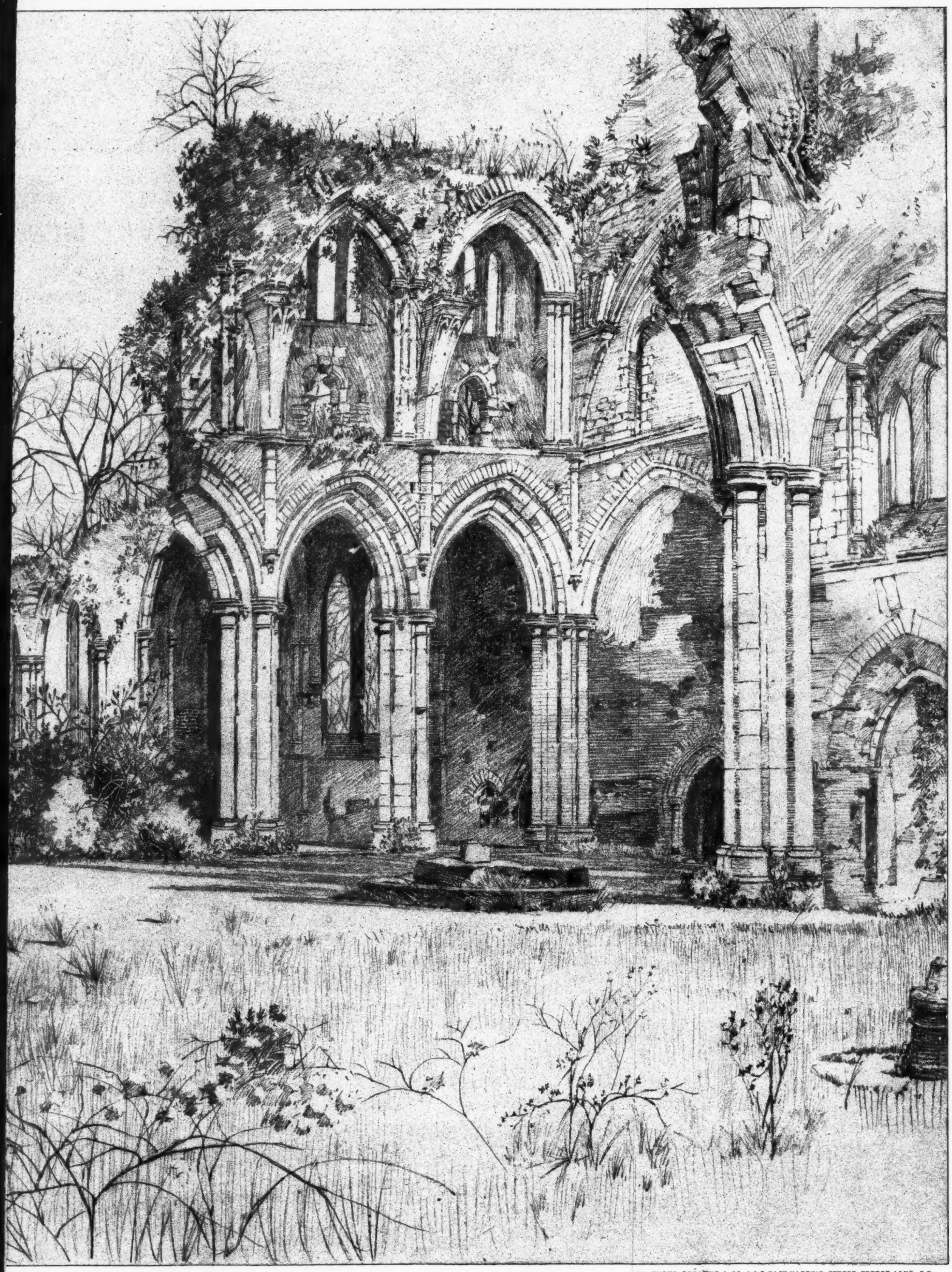

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'AIN.—No. 11. NETLEY, LOOKING EAST.

Y MR. C. E. MALLOWS.

NETLEY ABBEY.

Ground Plan.

Transitional - E.E. to Decorated

Decorated.

Elizabethan additions

5 . 0 . 5 10 20 30 40 50 100 Feet.

Scale.

NORTH TRANSEPT.

NAVE

CHOIR.

PRESBYTERY.

Aumbrey.

Altar.

corbel

Altar

Altar.

Window over

A

Elizabethan door.

SOUTH TRANSEPT

Chapel.

modern door.

Chapel.

Penthouse

CLOISTER.

CHAPTER HOUSE.

modern doorway.

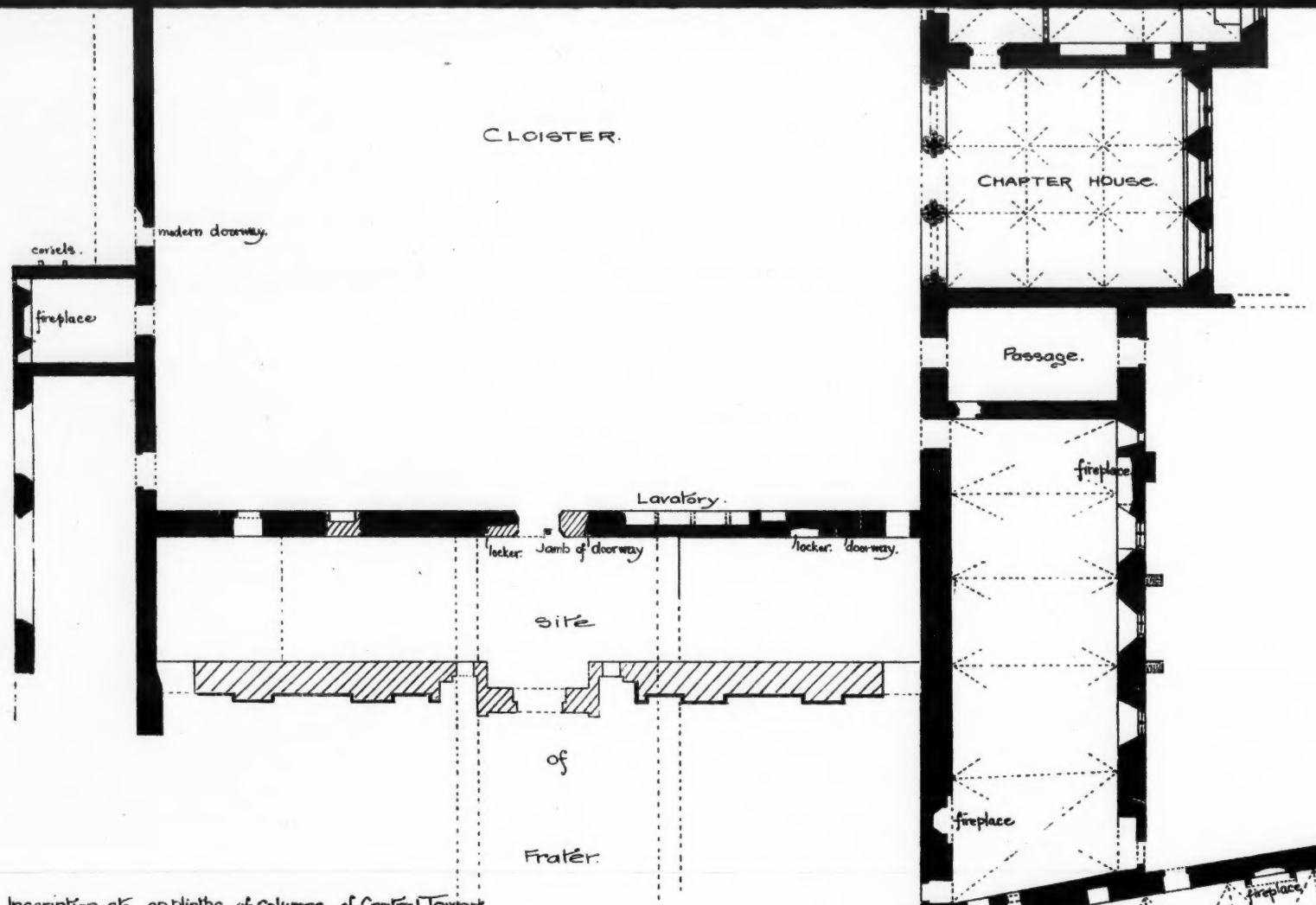
corbels.

fireplace

Passage.

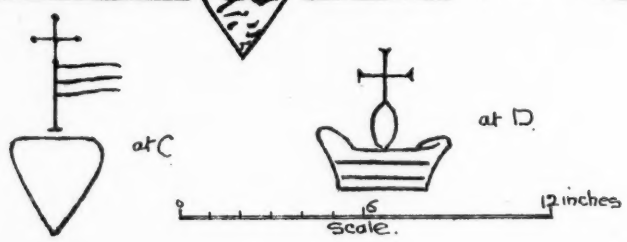
Building east of Church - probably the Infirmary.

120.0" to A (see above)

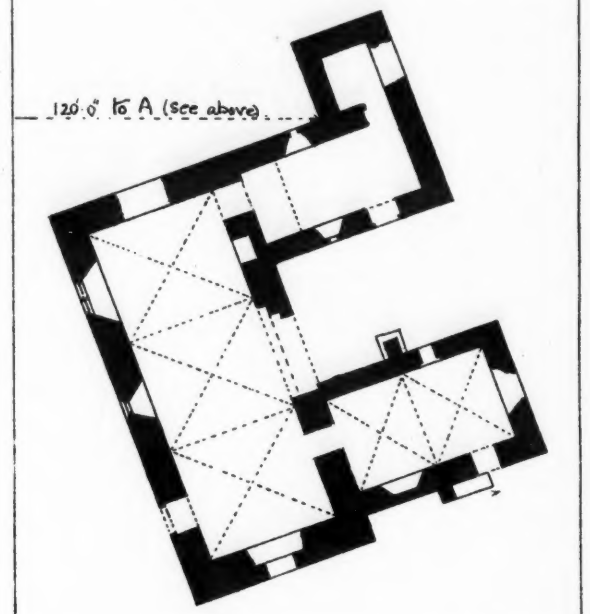


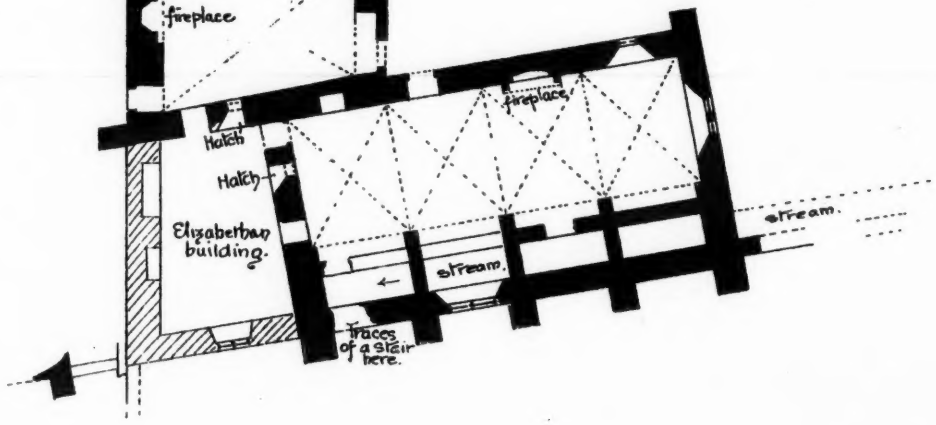
Inscription etc on plinths of Columns of Central Tower.
Incised lines about 6" above floor level.

at B



Building east of Church - probably the Infirmary.





Patrick to Paul
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